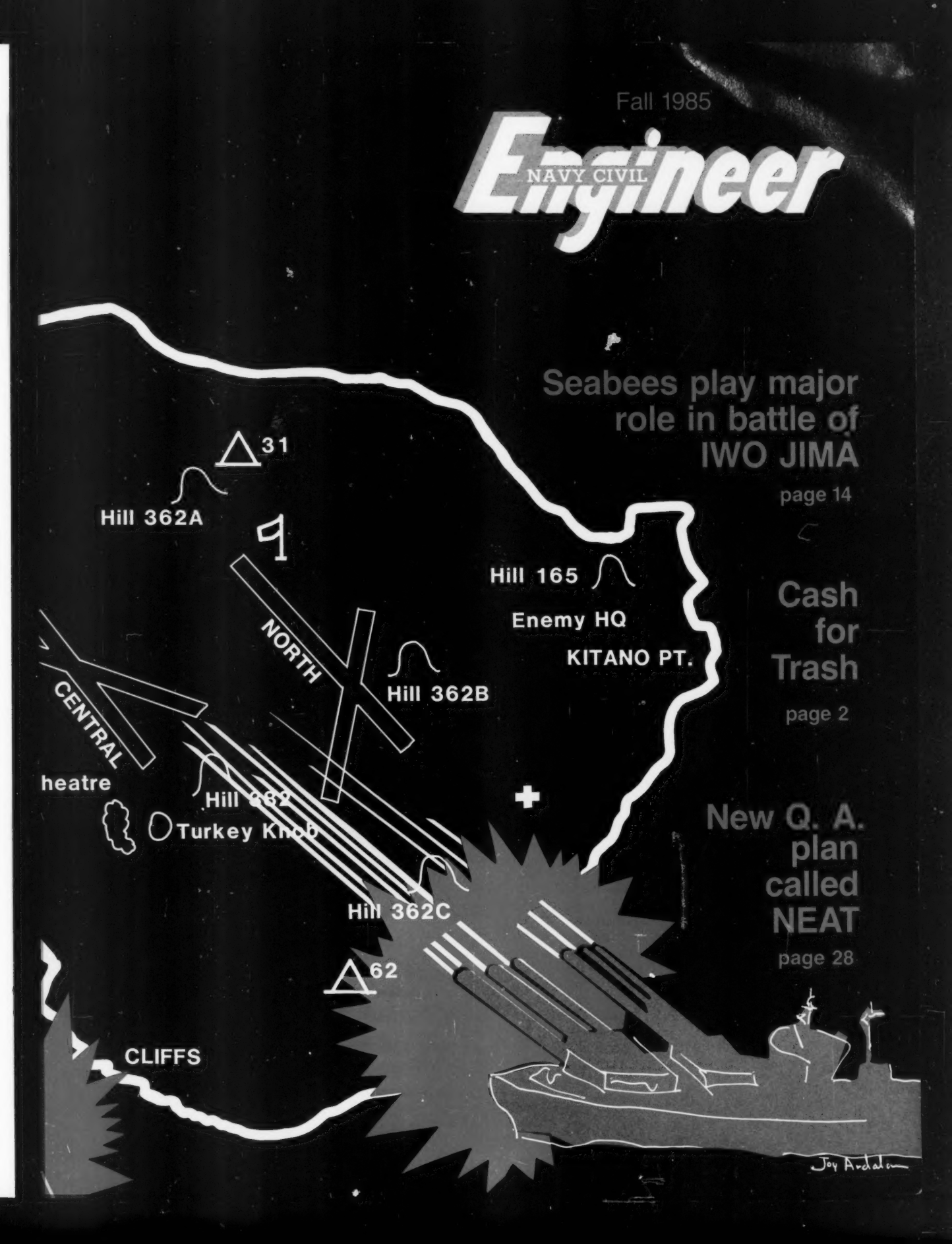
Fall 1985

NAVY CIVIL Engineer



Seabees play major role in battle of IWO JIMA

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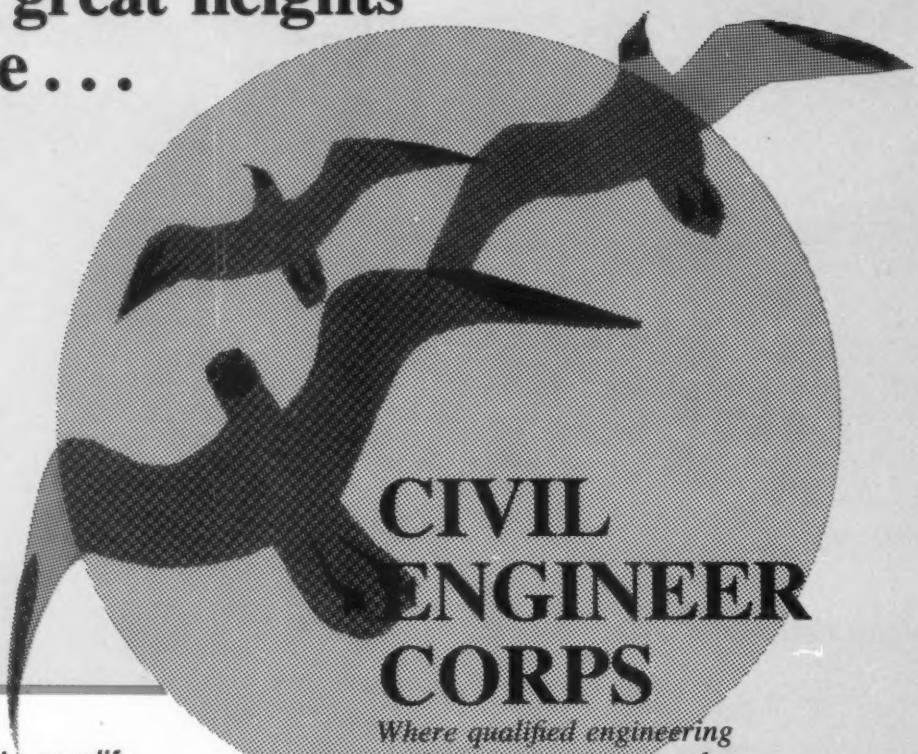

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LCdr. Joe Camp, CEC, USN
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Lt. Bob Hyde, CEC, USN
NAVFAC, NORTHDIV, Code 09R
Philadelphia, PA 19112
Phone (215) 897-3953 AV 443-3953

Lt. Matt Mlekush, CEC, USN
NAVFAC, SOUTHDIV, Code 09F
P.O. Box 10068
Charleston, SC 29411
Phone (803) 743-0711 AV 794-0711

Lt. Elizabeth Clarkson, CEC, USN
NAVFAC, PACDIV
Peark Harbor, HI 96860
Phone (808) 471-2245 AV 315-2245

Lt. Ric Marrs, CEC, USN
NAVFAC, WESTDIV, Code 09L1
P.O. Box 727
San Bruno, CA 94066
Phone (415) 877-7093
AV 859-7093

Lt. Barbara Westhaus, CEC, USN
Naval School, Civil Engineer Corps Officers
Port Hueneme, CA 93043
Phone (805) 982-5655
AV 360-5655

Lt. Paul Fuligni, CEC, USN
Public Works Center
Building 1A
Great Lakes, IL 60088
Phone (312) 688-2324
AV 792-2324

THE COVER

Iwo Jima, the scene of one of the hardest fought battles in the Pacific area near the end of World War II, is shown in a military-type map along with some artistic touches to show it is under seige by the American forces. Author Ted Murphy, Professor emeritus at CECOS, describes the battle and the important part the newly-formed Seabees, staffed mostly by older men, played in this turning point of the War against an enemy who wouldn't give up. Cover art by Joy Ardalan.

NAVY CIVIL Engineer

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JOHN PAUL JONES, JR.
Rear Admiral, CEC, USN
Commander
and
Chief Civil Engineers
FREDERICK G. KELLEY
Commodore, CEC, USN
Vice Commander
and
Deputy Chief of Civil Engineers

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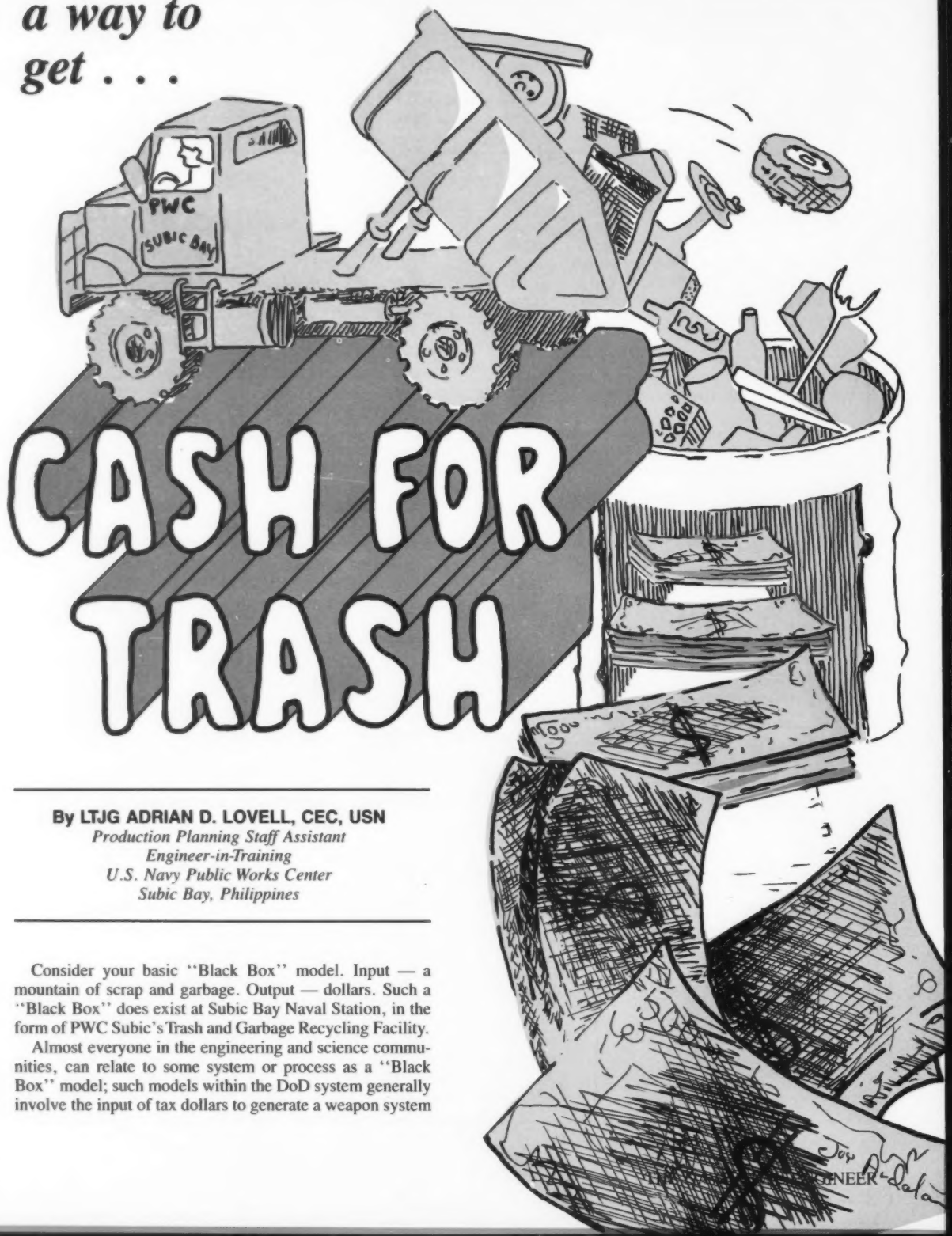
LES HELSDON
Editor

GAYLA LUTMAN
Administration

JOY ARDALAN
Contributing Artist

KAREN E. TATE
Circulation

PWC Subic Bay has found a way to get . . .



By LTJG ADRIAN D. LOVELL, CEC, USN
Production Planning Staff Assistant
Engineer-in-Training
U.S. Navy Public Works Center
Subic Bay, Philippines

Consider your basic "Black Box" model. Input — a mountain of scrap and garbage. Output — dollars. Such a "Black Box" does exist at Subic Bay Naval Station, in the form of PWC Subic's Trash and Garbage Recycling Facility.

Almost everyone in the engineering and science communities, can relate to some system or process as a "Black Box" model; such models within the DoD system generally involve the input of tax dollars to generate a weapon system

In operation since 1976, the Recycling Facility at Subic Bay produces between $250,000 and $500,000 annual income for the Navy

to support the defense mission. The Recycling Facility at Subic Bay, (the only Navy-operated facility of its kind in the Pacific) runs in reverse. Specifically, refuse generated from supporting the defense mission is processed and turned into tax-saving revenue.

The Facility, which has been in operation since 1976, produces between $250,000 and $500,000 annual income for the Navy; a significant increase in this amount is expected due to several improvement projects recently undertaken. Solid waste materials from all industrial areas in the U.S. Facility Subic Bay and ships in port are brought there for processing.

Items that are reusable or marketable are segregated and further sorted into various categories while the nonrecyclable materials are delivered to the base sanitary landfill. Through this facility, the U.S. Navy gains reuse of recycled material as well as monetary return for those items sold.

On the average, about 850 cubic yards of every imaginable type of solid materials are dumped daily at the 80-thousand-square-foot facility. The amount dumped varies depending on fleet loading and other factors including the degree of construction and various industrial activities going on. By estimate, 50 percent of the material collected is reclaimed either for reuse or resale.

Reuse and sale of the refuse is accomplished through joint efforts by PWC and the Defense Property Disposal Office (DPDO) Subic. The large amount of material involved makes processing and storage a real challenge for both activities.

Once a truckload lot of a particular material is collected and segregated, it is sent to DPDO for further sorting and subsequent staging for reuse or sale.

PWC stages onsite at the Yard, such items as plastics, cardboard, aluminum cans, wood and paper which are generated in relatively large amounts and resold by term contract. This is beneficial in eliminating government transportation costs and eases security problems involved with contractors traveling on base.

The largest categories of material retrieved at the Recycling Yard are wood and scrap metal, with paper and cardboard products also abundant. Tires, assorted wires and cables, as well as an array of items such as plumbing and electrical fixtures, nonfunctioning air conditioners, burned out electric motors and an endless number of various containers also accumulate rapidly.

In the reclamation business, one quickly learns the difference between trash and scrap. The old axiom, "One man's trash is another man's treasure," probably holds true to the highest degree at Subic Bay. Items such as those mentioned above, to most people would be and are discarded as useless trash once their usefulness in original form is gone.

All of these items, however, may be resold as scrap for reprocessing into another useful product. The only prerequisites are segregation and locating an interested buyer, the latter requirement has usually been easy to fulfill.

The DPDO prescribes a hierarchy of priorities by which materials can be disposed of: first, DoD activities may claim items for which they have a use.

In Subic Bay, the Recycling Center is the biggest contributor to Naval Supply Depot's pallet return program, which has realized more than $1.3 million in savings since 1983. From November 1984 to February 1985, PWC turned in 2,766 pallets, more than double the total number of pallets turned in from other sources.

About 90 percent of the pallets the Recycling Center has turned in were in good condition. Roughly, NSD can save $7.50 per pallet repaired. Newly manufactured pallets cost $12.30 each.

Some of those which can't be returned to NSD are brought to job sites where PWC reuses them for repair and minor construction projects.

Second, after screening for direct reuse, materials can be transferred to other U.S. agencies or used for command civic action programs such as Project Handclasp.

Lastly, items can be sold through the DPDO.

Sales of scrap items during the first quarter of FY85

Foreman Manuel Quindoy (from left) instructs Marcelino dela Junta and Enong dela Cruz how to pile rubber scrap.

A forklift pushes a newly-dumped pile of trash while a crane loads a packer trailer for delivery to the sanitary landfill.

Carlito Soria (from left), Fred Carpio and Delfin Bulatao feed a bailing machine with cardboards. All are members of the New Cabalan Negrito Labor Association which provides contract labor at the Recycling Yard.

increased significantly from that of previous fiscal years. From October to December 1984, operational cost totaled $30,000 while gross income was recorded at more than $90,000.

PWC has actually budgeted for a $300,000 income for FY85 although many are more optimistic that the half-million-dollar mark may even be met.

Improvements carried out in the operation and management of the facility attribute to the increased revenue.

MATERIAL HANDLING

Among these are the developing of a more structured process of material handling. Specific areas have been designated at the yard where different materials are staged. These are items that come regularly and are sufficient in quantity to justify segregation by their own categories. With this setup, the items are made immediately available for reuse or sale and thus reducing massive stock piles and eliminating incentives for theft.

One recent evolution of this improvement effort was the recovery of over $44,000 worth of materials from a secure storage locker. A lot of high value and new stock items, most in their original packaging, were presumably deposited in base dumpsters for subsequent theft from the easily accessible recycling yard.

These materials were inventoried by the Material Department and rerouted back into the supply system. Similar inventories are now set up monthly and should preclude build up of expensive, questionable "scrap."

SECURITY

Security has been a long-standing problem at the Yard, located next to the base perimeter fence. Intruders looking for high value and small pilferable items that can be resold easily in the local market pose a significant threat.

As an immediate measure, the number of night shift guards was increased, and buildup of stockpiles was eliminated through more efficient material processing. Since these measures were initiated in November, there have been no reported intrusions at the yard.

OTHERS

Projects are underway to provide improvements to the facility and its operations on a larger scale. A $200,000 Special Project is in its final planning stages. The project aims at reorganizing the layout of the yard, replacing deteriorated equipment and structures, and constructing, a new office, lunchroom and head facilities.

All improvements are aligned to a Navy-wide campaign for every one to be "recycling-conscious." Environmental laws which are now more strictly enforced greatly increased the cost of waste material disposal. Natural resources are depleting and their cost rising.

In 1983, the Chief of Naval Operations began to provide economic incentive to encourage the recycling of materials which used to be discarded. PWC Subic Bay is now being reimbursed for 100 percent of the sale of scrap materials turned over to DPDO. For many years, only 80 percent of the proceeds went back to the Center.

PWC, Subic Bay Recycling Facility is a "Black Box" system with many of the internal processes constantly changing. There is more to be done to develop the operation into its most effective form; meanwhile, money and effort now spent will be far outweighed by resources and tax dollars saved.

Young officer encourages sharing the fun

I have just completed a tour with Naval Mobile Construction Battalion Force, Port Hueneme, California and I have really enjoyed myself. As a result, I felt compelled to write a short article to try and attract other Junior CEC Officers to try their hands at being a Seabee.

So You Don't Want To Be a Seabee!

So you don't want to be a Seabee! Does the allure of faraway places like Japan, Okinawa, Spain, Puerto Rico, or duty on the Philippines scare you? Just married and don't want to leave home, your new wife or family? Or maybe you don't like being in charge of young construction men while learning on-the-job construction techniques, provides enough challenge.

If you answered no to any of these or similar type questions, your level of adventure may appear to be a little low. However, if you answered yes, then you have the makings of becoming a truly qualified Construction Battalion, Civil Engineer Corps Officer.

Just because you are not part of a Construction Battalion or Unit, doesn't mean you won't enjoy an extremely good CEC career. On the contrary, this is far from true. However, you could enhance your career and have just as many adventures and excitement, if not more, by being part of the "green machine." This part of the Navy allows us engineer types to really put our hands in actual construction and learn from all walks of life and skilled, as well as crafted personnel.

Each of the CEC fields, like public works, or training staff and construction contracts, allow you to become construction wise, but the Seabees really allow you to get your hands dirty. The planning, scheduling, training and actual construction to a successful conclusion, is what the Seabees are all about. Sounds a little romantic or corny doesn't it? Maybe so, but the real challenge is when materials don't arrive on time, you fall behind schedule, key personnel become transferred and military training always seems to create headaches and havoc to your production schedules. However, all these items have their place and truly test your abilities as a leader, manager, engineer and naval officer to the maximum.

Where else do you have a chance to live the Seabee slogan: "We Build. We Fight," but in a construction battalion. The Seabee junior officer position is basically geared to one thing; to promote the unit, its men, and to strive in becoming the best while under the careful guidance of the battalion commanding officer.

Just think, a true change in learning military tactics, personnel leader ship, construction techniques while encountering real wardroom camaraderie. If these ideas and types of experiences provide excitement to your life, then I strongly recommend you try for a billet of a lifetime.

Your battalion tour will enhance your career and provide you, your family and friends with memories that will last a lifetime.

Lt. P. F. Krug, CEC, USN
ROICC, Jacksonville, NC Area
Camp Lejeune, N.C.

Thank you for your letter and for wanting to share your good fortune with others. We hope potential recruits will take your advice.

Further comments on Public Works

I enjoyed both Bill Russell's and Harry Newman's comments on efficient Public Works. Although Navy Public Works may often appear bent, "it ain't broke." I fully agree with Bill that, "the Public Works Officer's (PWO's) priorities must generally be aligned with those of his boss . . ." I also agree with Harry that, "Management may be viewed as an art rather than a science." However, I am afraid we cannot expect the chain of command to provide additional management resources.

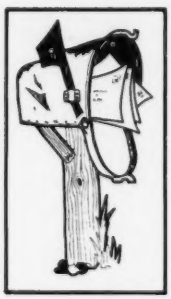
As Facilities Management professionals it is our job to use our management and leadership skills to improve efficiency while meeting the operational requirements of the command. With the trend toward more facilities and less O&MN funds we can expect less staff to manage our Public Works Departments.

Although they question some aspects of our system, the station commanding officers I have talked to in the past three years are extremely pleased with their Public Works Officer. The PWO's will be challenged to continue their great work and our Navfac professionals will be challenged to continue to help these frontline leaders get the job done as efficiently as possible with a minimum of overhead burdens.

Capt. E. B. Camden, CEC, USN
P.E.
National War College

Thank you Captain, your comments are appreciated.

Got a question, comment, suggestion, or gripe? Please send it to:



Editor, Code 20M, CECOS,
Port Hueneme, CA 93043

speaking from topside

Commander's reflections after 100 days

I am very pleased to have this opportunity to address the Civil Engineer Corps community and to share with you some of my views as the new Commander of the Pacific Division, Naval Facilities Engineering Command/Commander, Naval Construction Battalions, U.S. Pacific Fleet.

It is especially appropriate that I write this article now as I have just completed my first 100 days here, and my initial impressions and expectations have been confirmed by the experiences of these three months.

Taking charge of a new command is always an exciting prospect and the fact my command is located in Hawaii and integrated with the U.S. Pacific Fleet headquarters is icing on the cake at this one.

The excellent reputation of the PacDiv/CBPac organizations was well known to me long before I ever set foot on Hawaiian soil. Having had time now to observe my staffs in action and to visit more of our major field activities I have come to appreciate even more the tremendous responsibilities and the fine work that is being done in the Pacific theater by the NAVFAC-CEC-Seabee family.

I follow in the footsteps of some great officers who have led these two organizations well, and my plans for the future are to carry on the fine tradition of fleet support that was established long before I took command.

Those of us who work with the Seabees and in the engineering field divisions realize that our mission is service to the fleet. When the average citizen thinks of the Navy, his first thought is of ships and airplanes, and more especially of war ships and war planes.

The tremendous industrial and administrative plant of the Navy which supports those ships and planes is rarely seen in its true perspective — and is usually taken for granted. But a modern Navy would soon be unable to put to sea were it not for the support of its shore activities, and the effective cruising range of the fleet is in large measure determined by the efficiency and locations of its shoreside bases of operations.

Here at the Pacific Division and CBPac, our mission is to build and maintain bases for Navy and Marine operations from the West Coast of the Continental United States to the East Coast of Africa and from the Bering Sea to Antarctica.

This is a vast area that spans more than 100 million square miles. Direct support to the Pacific Fleet command is a monumental task for any Force Commander.

I'm proud and pleased to state that during the short time I've been onboard, our Seabees have exceeded my expectations, and they continue to reap praise from our many fleet customers.

Although our battalion main bodies are situated at Guam and Okinawa, small detachments range throughout the Pacific — at Adak; at Sasebo and Iwakuni, Japan; and at Subic Bay, Philippines.

Many of their jobs relate to the upgrade of facilities that will enhance the quality of life for our Navy men and women and Marines.

Rehabbing berthing facilities; constructing racquetball courts; building a fleet recreation center; and building a religious education facility, are just several of the many personnel support construction jobs in which they're involved.

Our Seabees also provide continuous assistance at the waterfront. They are presently developing a prefab yard at Guam to build camels for fleet activities throughout the Pacific.

They are repairing roads and building ammunition handling facilities at the Naval Magazine at Guam and in the Philippines, and recently completed a 7,000-foot taxiway for the Marines on Okinawa.

Seabee divers from Underwater Construction Team TWO consistently perform valuable underwater inspection and repairs of piers and underwater test and evaluation ranges.

Our Civic Action Teams have proved to be invaluable to the Micronesians by constructing neighborhood meeting places, water catchments, bridges, and roads while helping to preserve the unique customs of these small island communities.

Seabees continue to uphold the many fine traditions of the Navy and the Construction Force. I truly believe they are a valuable asset to our Pacific Fleet Commander.

The Pacific Division is the only one of the six NAVFAC Engineering Field Divisions headquartered outside the Mainland. We have been designated by the Secretary of Defense as the U.S. construction and contract agent in most of the Pacific and Indian Ocean areas.

As such, we direct the design and construction for all the military departments; other U.S. agencies such as the Department of State; and foreign governments. Last year, through our Officers in Charge of Construction (OICC) at Pearl Harbor, Guam, Manila and Yokosuka, the Pacific Division supervised construction and monitored work in place of a value of more than $350 million.

Continued on page 31

Reserve PH1 wins coveted Cdr's Award . . . again!

PH1 John Buffalo (left) accepts the Commander's Award for journalism excellence from Captain (se1) Ralph Lee Biggers, Commanding Officer of RNMCB-16 while BM1 Richard Smith looks on.

For Editorial Excellence

PH1 John M. Buffalo has won the coveted Commander's Award for Editorial Excellence for an article published in the Navy Civil Engineer Magazine. PH1 Buffalo won the honor for his article "Earthquakes, The Big One is Coming!" which appeared in the Summer 1984 issue. Buffalo is assigned to RNMCB-16 in Los Alamitos, Calif., as an Assistant Public Affairs Officer.

Presentation of a bronze plaque award was made by Capt. (Sel) R. L. Biggers at a ceremony held June 24. The plaque was appropriately inscribed. Capt. Biggers also read part of the contents of a letter received by Buffalo from RAdm. John Paul Jones, Jr., Commander of the Naval Facilities Engineering Command, and Chief of the Civil Engineer Corps which said: "Your winning article for 1983 and your 1984 submission both exhibit thorough research and readability in the finished product. Articles like yours contribute greatly to *Navy Civil Engineer* and provide valuable information that is often not available elsewhere. I hope we can expect future contributions. . . . Congratulations! We are proud to have you as a member of the NAVFAC family."

Honorable Mention

Four authors received Honorable Mention Awards and letters from RAdm. John Paul Jones, Jr., for three articles which appeared during 1984.

Captain Kenneth W. Meeks, CEC, USN for "Foreign Negotiations Require Tact, Diplomacy, Know-How," which appeared in the Spring Issue 1984.

Mr. Hiroshi Kojima (Co-author) for "Red Hill Facility Modernized," which appeared in the Summer Issue 1984.

Mr. Glenn H. Higuchi (Co-author) "Red Hill Facility Modernized," which appeared in the Summer Issue 1984.

Commander Bruce B. Geibel, CEC, USN, for "The Atlantic Alliance," which appeared in the Fall Issue 1984.

Letters to all four recipients ended with RAdm. Jones' statement, "I concur with the committee's recommendation and offer my personal congratulations for a job well done."

Nominations for the awards were made by a special award committee comprised of Captain John L. Dettbarn, Commanding Officer of the Naval School, Civil Engineer Corps Officers; Marge Holtz, NAVFAC Public Affairs Officer; and Les Helsdon, the magazine's Editor In Chief. All feature articles published by the magazine during the publication year are considered for awards by the committee.

Notes about the winner — John M. Buffalo

For the second year in a row, Photographer's Mate John M. Buffalo of Torrance, Calif., has been awarded the Commander's Award for Editorial Excellence from the Commanding Officer of the Naval Facilities Command for an article published in the Navy Civil Engineer Magazine. To win the honor once is prestigious, but to win it twice is unprecedented.

In 1983, Buffalo won the award for his article "Wave Action." In 1984 the winning article was entitled, "Earthquakes, The Big One is Coming." Both articles were timely, and written to be easily readable. They also showed that a great deal of research had been done before the actual writing.

Petty Officer Buffalo is a teacher in his civilian life and holds degrees in geology and management. He is married to the former Cadance Lyn Marquand and is the father of two daughters. When he isn't serving as the Assistant Public Affairs Officer for RNMCB-16, Buffalo is involved in his hobbies and other interests. He is interested in photography, model railroading, and is writing an historical work on the history of the Southern Pacific Railroad's Sunset Route.

Try building a shipyard

s-s-s-s-s-s-s-s-s-s-s-steam

plant worth $25 M

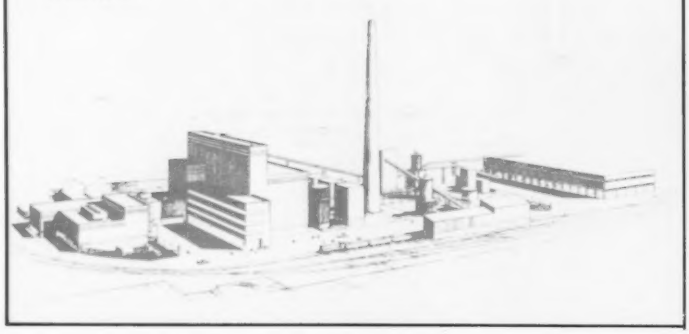
By LT JEFFREY S. BANGMA
CEC, USNR
ROICC Northwest Area,
Silverdale, Washington

Have you ever built a coal fired steam plant? How about one that involves eight simultaneous contracts, six remote construction sites, $25 million dollars worth of government furnished equipment (GFE), and a mile-long, 20-foot-deep tunnel down the main street of a congested, 100-year-old shipyard? Western Division, Naval Facilities Engineering Command (WESTDIV) has set out on just such an endeavor at the Puget Sound Naval Shipyard in Bremerton, Washington.

In early 1970, the need for the new steam plant at the shipyard became apparent. The existing 40-year-old boiler had to be replaced. A 1974 seismic study underlined the need when it found the 75-year-old structure inadequate to withstand a 25-year earthquake, so the P-500 Steam Plant Project was born.

It was a project destined to set records in the anals of NAVFAC history. Its purpose would be not only to replace the existing steam plant but to upgrade all the base utilities, including compressed air, power distribution, emergency electric generation and pure water systems.

Puget Sound Naval Shipyard Steamplant



Many challenges were faced by the WESTDIV team. They included: where to locate a coal plant when the only unused Navy real estate is 50 feet away from a civilian housing area; how to get the steam to the major steam loads on the opposite end of the shipyard; and how to lay out a plant with enough space to convert it easily to cogeneration, burning of refuse derived fuel (RDF), or wood waste, or both, all within an eight-acre site.

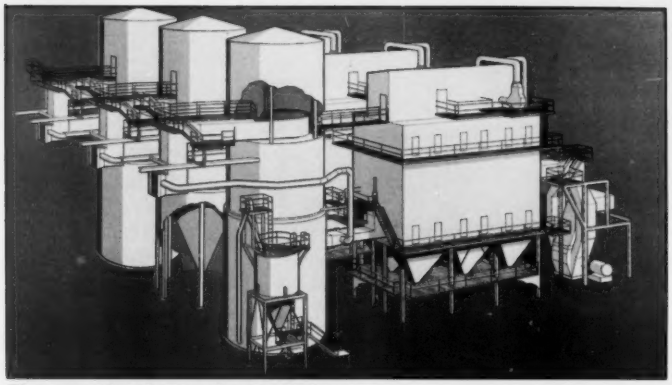
After a number of concept studies, which investigated decentralization of the generation capacity as well as the numerous types of fuel, the Navy selected a firm to begin actual design. The project would be a central coal-fired steam plant on the west end of the base with a mile-long tunnel to distribute steam, electricity and compressed air throughout the base.

During the early stages of design, the A&E, who is experienced in coordinating multiple contract projects, and the customer, who had a strong desire for involvement in the equipment design and selection process, convinced the WESTDIV team to break the project into three phases involving eight contracts. Phase I would procure the GFE, Phase II would construct the distribution tunnel, and Phase III would build the main plant and install the GFE.

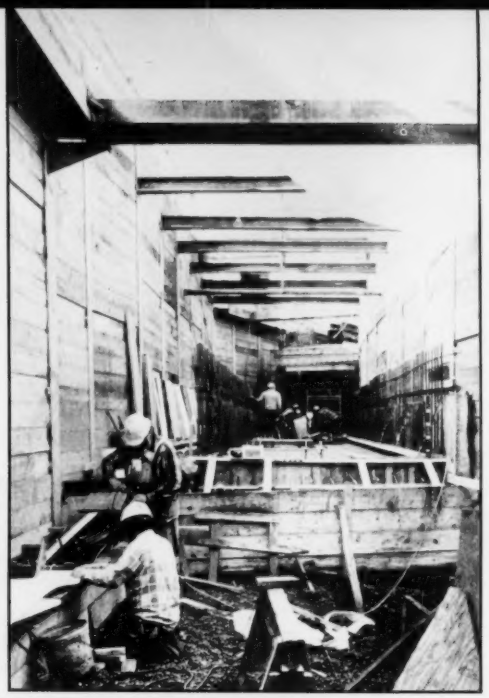
Phase I, currently underway, entails six procurement contracts for the major pieces of government furnished equipment. These design and furnish contracts, were two-step procurements awarded directly to the equipment suppliers to allow more direct to the equipment suppliers to allow more direct control and customer involvement in the equipment design.

Awarding them two years before the Phase III contract allowed the A&E to integrate the GFE design data into the main plant construction contract and erection specifications, instead of relying on the construction contractor to procure the equipment and do that detailed design work.

The six Phase I procurement contracts total $25



Flue gas cleaning equipment being supplied as government furnished equipment to the main plant contractor.



Utility tunnel under construction. The two rows of rebar illustrate the width of the concrete tunnel cross-section being installed.

million, with awards starting in March 1983 and continuing into 1985. The equipment is scheduled to arrive at the site on trucks and rail cars over a 23-month span of time.

The first Phase I contract is for the coal-fired steam generators. The contractor is providing three stoker fired 140,000 lb/hr units that are capable without major modication of switching to cogeneration, and/or burning RDF or wood waste.

The Navy through the second contract, is purchasing a $6 million dry flue gas desulfurization system. It will remove the fly ash and the sulfur dioxide (SO2), which causes acid rain, from the boiler exhaust gases.

The system, made up of eight buildings and a lot of duct work, accomplishes its goal by spraying a lime and water slurry mix into the flue gas within the spray absorbers.

The lime slurry chemically reacts with the SO2, dries, and is literally vacuumed from the air along with the fly ash in the fabric filter baghouses. The calcium sulfate product is then disposed of in a municipal dump.

Three other equipment contracts were awarded: One contractor will supply compressors and air dryers for $2.2 million; one will supply transformers and switchgear for $4.4 million; and a third will supply diesel electric generators for $4.8 million. The diesel contract also includes over 125 pieces of shipped loose auxiliary equipment.

The last Phase I contract will provide a Supervisory Control and Data Acquisition (SCADA) System that will expand the current shipyard system tenfold to 27,000 points of control, indication, and telemetry.

Expedite has been the buzz word for nearly all of the Phase I equipment design work.

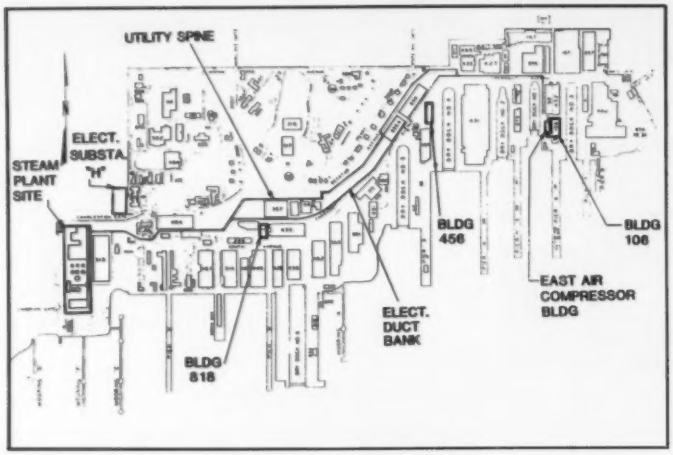
Protests to the General Accounting Office (GAO) significantly delayed the awards of two Phase I contracts, which in turn delayed the submission of critical equipment design information to the contractor. To encourage the timely completion of the Phase I equipment designs, four of the six contracts contained liquidated damages clauses on those critical design submittals. This brought the initial design submittals in quickly, but for some of the contracts, the completed design submittals still came slowly. This further delayed the overall Phase III design for the main plant.

The Phase I Assistant Resident Officer in Charge of Construction (AROICC) has been intensively involved in the preliminary design process, logging 22 trips to the equipment supplier's offices working out change orders and design details and inspecting finished equipment.

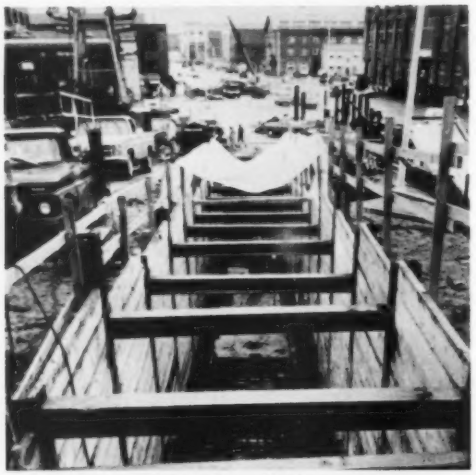
His team and the A&E have reviewed over 8,000 detailed design submittals in checking compliance to the equipment specifications. The customer has also had five full-time employees reviewing the equipment submittals for their needs.

Phase II of the project consists of a single $19 million utility distribution tunnel contract. The tunnel work was split out from the main plant design at the 50% stage, to enable an early start, anticipating significant construction delays due to encountering unknown underground obstructions. The contract was awarded in August of 1983.

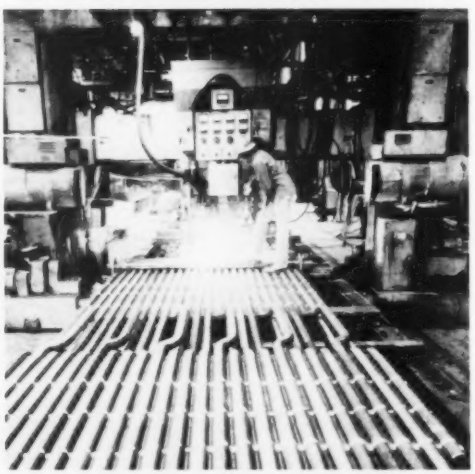
What makes this contract interesting is that it entails digging up Puget Sound Naval Shipyard's only main road, placing in it a mile of 10 x 10 foot concrete tunnel and a mile and a half of electrical ductbank, all seven feet below grade. Pilot trenches are being hand dug for the first seven feet along both sides of the tunnel route to preclude major utility in-



Project spans the entire shipyard.



Tunnel work involves digging up street.



Boiler water walls are shop made.

terruptions to the shipyard, which will remain in full production throughout the project.

Phase II's currently scheduled completion date of August 1986 is four months behind the original schedule due to the myraid of unforeseen conditions encountered to date.

Phase III, the main plant construction contract will tie Phases I and II together, erecting the plant structures, installing the Phase I government furnished equipment, and connecting to and pulling cable through the Phase II utility distribution tunnel. Award is expected in summer of 1985.

Prospective bidders had to satisfy rigorous prequalification requirements before being approved as a prime contractor for the Phase III contract. Twenty-one of the 35 firms that tried were successfully prequalified and most of them are among the top 100 contractors in the country.

The successful bidder for the main steam plant contract will have his hands full. The average workforce on the job is expected to be 180 men with peaks of up to 300. Three thousand drawings, 5000 pages of specifications, and a five-foot stack of operation & maintenance manuals for the GFE make up Phase III contract.

There is little or no space available as laydown area. One boiler erector stated he'd need the entire eight acre site just to "shake out" one of the boilers for erection!

Also, the poor soil will require over 2000 piles which collectively total over 17 miles in length to support the facilities, and if that's not enough, some of the remote site work involves buildings in a controlled industrial area where clearance badges take up to 30 days to obtain and personal escorts are required until then. The Phase II work includes not only receipt, storage, and erection of the GFE, but start up, performance testing, and a 90-day operation period as well.

Staffing for this job has been a challenge to everyone involved. WESTDIV has had as many 18 people involved at one time and the designer had upwards of 75 people involved during the critical design periods. The customer has five full-time people with temporary support for up to ten additional personnel in critical periods.

The ROICC has had four full-time and two temporary personnel handling the Phase I work alone. The Phase II staff includes four dedicated employees, and the Phase III ROICC staff is expected to reach up to 25 people during the peak construction effort.

Everything associated with this job has been done in a big way. The half-size plans and specifications produced for bidding would fill an 18-foot cube! It takes 22 overstuffed drawing racks just to hang one copy of the contract drawings.

Does the project sound interesting and challenging? It certainly has been so far. If you hurry you might still get involved, as the project is expected to last into the very late 1980s. □

Navy gets new firefighting equipment

Technology derived from investigation of low vapor pressure liquid flow into rocket engine turbopumps has been applied in the development of a high-flow, high-suction-lift 5000 gal/min pump, which is used in a small, lightweight, helicopter portable firefighting module.

The module is self-contained and consists of a pump, gas turbine engine, control system, priming system, and water discharge system. Its normal mode of operation is drafting water from any available body of water through three 8-inch flexible suction hoses and discharging through three 5-inch firehoses.

The pump requires 550 horsepower to produce 5000 gal/min at a 150 psi discharge pressure with a 20-foot suction lift. The module will operate at this condition for three hours without refueling.

The unit was delivered by NASA to the Navy in the spring of 1984 and is presently being demonstrated in various applications. It can be flown by helicopter sling into remote areas for firefighting, dewatering, flood control, emergency pumping, and other applications.

Award for Excellence to NCEL duo

Dr. Robert Alumbaugh, research chemist, and Spencer Conklin, research materials engineer, of the Naval Civil Engineering Laboratory, Port Hueneme, Calif., were recently honored with the 1985 Special Award for Excellence in Technology Transfer.

The award, established this year by the Federal Laboratory Consortium for Technology Transfer, recognizes individuals within Federal laboratories who have done outstanding work in transferring technology.

Alumbaugh and Conklin were among those receiving the award during the Consortium's Spring Annual Meeting, held in May, at the Brookhaven National Laboratory, Long Island, New York.

Navy-water wins State water-tasting contest

You've all heard of wine-tasting contests, but is there really a contest to determine the best-tasting water? According to Jeanne A. Light, PAO at the Pacific Division, a few Navy civilian employees were involved in Hawaii's first contest to judge the best-tasting water in the State.

The contest was no small feat — we're talking big time here — where top-name judges, mostly media types, sampled water from nine different sources throughout the state's four counties as well as one entry from the Navy's water well at Lualualei.

The contest was a small part of the Hawaii Section of the American Water Works Association's (AWWA) 11th Annual Conference at the Ala Moana Americana Hotel May 1-3.

Adding to the spirit of the event, each of the judges sat before his or her nine glasses of water and swigged, swished, sipped and sniffed the various samples.

"Could you give us a hint of what we're looking for?" asked Tomimbang.

"Water," said Shimazu. "It should taste like water."

After tallying the votes, Shimazu announced the results — the judges were almost unanimous in their decision — and the winner is (with five first-place votes and one second-place vote): the Navy water from Lualualei!

Special Olympics track developed by Navy engineers

Three civil engineers from Naval Civil Engineering Laboratory (NCEL), Port Hueneme, recently donated time and expertise to develop a running track at Camarillo State Hospital for the Special Olympics area meet.

Mel Hironaka, Camarillo, designed the eight-lane, 50-meter track, which can even accommodate wheelchairs; Harold Husano, Camarillo, prepared the drawing; and Steve McCarel, Oxnard, who once a month trades his civilian attire for a naval uniform, coordinated with reserve Seabees to construct the track.

"We've never been able to hold a meet on hospital grounds because we couldn't offer track events," remarked Jacqui Hood, recreation therapist and Special Olympics coach.

Seabee reservist Tom LaFrance assists special Olympian "Leroy" view fellow athletes Cathy and Will through transit, while reservist Bill Jacobs levels the site for the Camarillo State Hospital special Olympics Track.

In the past, Camarillo area meets were held at local high schools. Jacqui added, "Generally, it's difficult to coordinate meets due to conflict with school activities."

This year was to be no different. Unable to secure a high school field to facilitate the Special Olympics, Jacqui's alternative was to hold the meet at Camarillo State Hospital and drop track events from the competition.

"Not any more," Jacqui boasted as she wheeled the chalking cart to the new track field. Thanks to NCEL and Reserve Naval Mobile Construction Battalion 17, Construction Battalion Center, Port Hueneme, "The 1985 Camarillo area meet will include track events — allowing more Special Olympians to participate."

advice of counsel

By TONY KUSHNIR
Associate Counsel
Real Estate and Housing
Counsel's Office
NAVFAC

The United States Navy today, controls and administers over 13.3 million acres of fee-owned land across the United States. Its holdings are varied as they are vast. They range from desert to salt water marshes to forest lands; from industrial to office to prime residential properties. The various uses the Navy makes of these properties depends, of course, on the particular mission and operational requirements of each individual activity which occupies the sites.

Under the constitutional principle of "sovereignty," state and local governments have little if any authority to prohibit or regulate Navy activities on Navy lands except when expressly so provided by federal law. Focusing on only what the Navy can or cannot do on its property, however, is only half of the story. Land development adjacent to or in the immediate vicinity of one's property can have a dramatic impact on its use and occupancy.

Such problems are not unique to the Navy nor to the federal government, but are shared by each and every individual property owner. It was precisely because of an awareness of this problem, that local governments began to regulate land use by the legislative process called "zoning."

These remarks will be addressing the concept of zoning and Navy participation as landowner in the zoning process. Navy participation in zoning proceedings is not new. It has been the established policy of Navy with respect to implementation of the Air Installation Compatible Use Zone (AICUZ) program since 1977. See OPNAV Instruction 11010.36 dated May 25, 1979. Navy participation in local zoning proceedings, however, should not be limited to the AICUZ program. Participation in the process to protect Navy resources and assure prevention of incompatible development is not only legitimate, and necessary in the context of the Navy's exercise of its rights as a property holder, but helpful in terms of intergovernmental relations. However, such zoning participation may entail consequences which the Navy should be made aware of, particularly in the following areas:

- Relations with local citizenry. Unless Navy motives are carefully and fully disclosed, local citizens may misperceive the Navy's goal to be an attempt to lower property values for subsequent land acquisition; thus reducing the Navy's effectiveness in participating in the process.
- Possible inverse condemnation liability. Landowners affected by the zoning action may sue the Navy alleging that the land restrictions are so onerous as to constitute a "taking" of property and requiring compensation.

This discussion is designed to give a general overview and summary of the legal aspects of the zoning process. It is not designed, however, to provide answers to specific questions dealing with individual zoning actions as each such action depends on the facts and circumstances surrounding it. Any legal analysis concerning the rights and responsibilities of the parties therein is similarly so dependent.

The Navy as a landowner should be aware of and, in some instances, directly participate in local land use proceedings and affairs. It is the local government which exerts, perhaps, the greatest amount of influence in determining *when, how, where,* and in *what manner* private property will be developed and used. As our cities and towns continue to grow in population and size, the Navy officials will become more involved in local government affairs as naval facilities once considered remote from these population centers become subject to land development pressures resulting from urbanization.

Counties once considered rural "back-waters" are now subject to these same development pressures. A substantial degree of knowledge and understanding of land use regulation process is now required of *all* landowners so that they may participate in a meaningful manner.

Proper attention to and a basic understanding of the zoning process will assist the Navy in:

- ensuring that land adjacent to naval facilities does not threaten the existing or contemplated use of these facilities regardless of whether the Navy has the authority to acquire the property, and
- assuring that land uses surrounding naval facilities are developed consistent with Navy objectives.

Zoning: Basic concepts

Land use is regulated most directly by local authorities (either by a municipality or a county) by the enactment of a "zoning ordinance," though you should be aware that other types of legislative enactments can directly influence the use of private property — building and housing codes, subdivision ordinances and the like. Because zoning ordinances are the primary source of land use regulation, this discussion will focus on this area of law.

The power to "zone," that is to regulate and prohibit the use of private property, by a local authority is well established in case law. Such authority derives from the state and, as such, it is specifically provided for by state statute. Most, if not all states, have enacted a uniform enabling act so that the basic tenets, rules and procedures for a local authority to exercise its zoning power are similar if not the same for each jurisdiction in the United States. These are as follows:

I. **All zoning ordinances must be enacted pursuant to a comprehensive plan.**

A comprehensive plan need not be an exhaustive and detailed study, but it must show the *overall* picture of what the local authority contemplates for the development of its area of jurisdiction. This plan must be adopted in accordance with established procedures for zoning ordinances. The process involves public notice and hearings before local commissions and the local legislative body. Substantive changes to existing zoning ordinances will require changes in the comprehensive plan.

Formulation of the comprehensive plan by a local authority is similar to

a 35% design plan required in our A&E contracts — it provides the basic features and major aspects of the project. Unlike the 35% drawing, the comprehensive plan, after the adoption of the zoning ordinance, remains the underpinning of any future zoning action.

It is for this reason that it is highly recommended that the landowner become thoroughly familiar with it. The comprehensive plan can be found in the local city or county clerk's office as well as the local planning, building or zoning department.

Navy awareness of what the local authority envisions as the eventual use of adjacent or surrounding property irrespective of what the current use will assist in assessing Navy program requirements for the facility at issue to prevent surprises in the future. *"Forewarned is forearmed."*

II. Zoning regulations may limit and even prohibit certain uses on private property to the economic detriment of its owner so long as such enactments are not they are clearly arbitrary and have no relation to the public health, safety, morals, or general welfare.

The overall goal of the Navy in any zoning action is to have each local authority enact zoning legislation which preserves existing compatible land uses, and prevents conflicts between adjacent land uses and the use of the respective Navy installations. Achievement of this goal requires a knowledge of the zoning classifications utilized by the local authority and an understanding of the process in which the authority applies such classifications to private property.

The local zoning ordinance as well as the zoning map, which delineates each zoning district, can be found in the office of the local building official or planning department. Updated copies of these documents should be obtained, retained and maintained at the local Navy installation for reference.

Further, the name of the local community liaison officer for the Navy as well as a mailing address should be given to the appropriate local official (county or city clerk) as well as to any other official designated to issue notifications of impending zoning actions, so that the Navy is put on the mailing list for such actions.

The general rule governing the validity and legality of local zoning enactments is that zoning will not amount to a taking and will be upheld unless it is clearly arbitrary and unreasonable, i.e., unless it has no substantial relation to the public health, safety or general welfare. *Penn Central Trans. Co. v. New York City,* 438 U.S. 104 (1978).

This area of the law, however, is very complex and loaded with many pits and pratfalls. There are numerous cases where a zoning action is challenged on the basis that notwithstanding the stated public purpose the primary reason for the action was to benefit a particular landowner.

These cases raise the issue of federal agency involvement in the zoning process. The general rule is that the Navy may ordinarily participate in local zoning proceedings without fear of immediate liability for a taking of the subject property should the action be later held to be invalid.

The Navy like any other landowner, may seek zoning advantageous to its interest without financial liability for zoning impacts on property values. The most common form of participation is by petition to the zoning authority either in writing or at a public hearing where the Navy would present its views with respect to a proposed zoning action.

Such participation can be as simple as a letter or as complex as an oral presentation with attendant studies, expert testimony, graphs or other documentation.

It is the local zoning body which would be liable for any inverse condemnation taking since it is the body ultimately responsible for the zoning decision.

The only exception to this rule is where a federal agency goes beyond mere participation in the zoning process and takes affirmative, egregious steps to lower property values. For instance, the National Park Service was held liable when it sought to affect the zoning process concerning the development of certain private lands when the Park Service, in addition to opposing the proposed rezoning of the private land to a more intensive use, acquired a tract of land adjacent to the private parcel and denied the necessary traffic access to support a rezoning of the parcel for a more intensive use.

In addition, Park Services representatives pressured local officials into denying land use changes and permits which the landowner of the private parcel was already entitled to under existing land use regulations.

What was wrong about the Park Service actions here was not its opposition to the rezoning of the private parcel but the totality of all of its actions in what appeared to the Court as an over attempt to artificially lower the property value of the private lands involved. *Drakes Bay Land Co. v. U.S.*, 424 F.2d 574 (Ct. Cl. 1970).

Where there are no findings of deceptive, unfair or predatory practices, the courts are unanimous in denying compensation.

Navy use of and involvement in the zoning process should not be limited to appearances at public hearings. The zoning process also serves as a mechanism for providing information to the public as to any proposed development on private lands. Today, most local authorities have zoning regulations which require consideration by local planning and zoning commissions for any large scale or intensive developments.

Public notices are distributed to adjacent and nearby landowners which outline, in detail, the proposed development. Plans and plats are placed on file for public review. The Navy activity concerned should monitor these local commissions and boards for any development which may be inconsistent with or be an encroachment on the Navy mission.

Such monitoring would allow the Navy to be alerted to an early stage of the proposed development to have its input either in the zoning process or

Continued on page 24

Moments in History

40 YEARS LATER

We salute the 133rd NCB, Seabee heros of the battle of

IWO JIMA

When the Seabees and the Marines climbed over the sides of transports off Iwo Jima on February 19, 1945, a chaplain handed some of them a small card upon which was printed: "Lord, I shall be verie busy this day. I may forget thee, but do not thee forget me." The prayer had been written by Sir Thomas Astlie, one of Cromwell's generals 300 years earlier in 1645.

The Marines and Seabees, particularly the 133rd NCB, and Officer-In-Charge Cdr. Ray Murphy, would indeed be busy on that day and for many days thereafter.

The 9th Naval Construction Brigade, Captain (later Commodore) R.C. Johnson, CEC, was composed of two regiments: the 8th and the 41st. This brigade had been activated on January 5, 1945, after training with the Marine 4th and 5th Divisions on Maui, T.H. since October 1944.

By TED C. MURPHY
Professor Emeritus, CECOS

The landing itself was practically unopposed, but when the landing force was ashore on the black sands of the volcanic island, the defenders let loose with all weapons. Casualties began to accumulate immediately. It was impossible to "dig in."

The 41st Regiment, composed of the 31st, 62nd and 133rd battalions were assigned to the assault force: the 5th Amphibious Corps. The 133rd battalion was the only Seabee unit to put all hands ashore on D-Day.

It was three years, two months and four days since the attack on Pearl Harbor and the war had just 175 more days to go; Mussolini had only 68 more days to live and Hitler would outlive him by just two days.

The year 1944 had not been a good year for the Axis. First, the U.S. 5th Army entered Rome on June 5; then Hitler's astrologer misspoke himself and the main German force intently watched Patton's "army" opposite Calais while the Normandy landing succeeded.

On June 15 the Marianas Operation began and in July, Hideki Tojo and his cabinet resigned after announcing the loss. Then came the fall of Paris, August 25, and in quick succession Palau, Surigao Straits, Lingayen Gulf, Leyte, Mindoro — and the Pacific war was suddenly confined to a small body of water bounded by Iwo Jima, Okinawa and Japan.

The fortifications of Iwo Jima were formidable. Machine gun emplacements were positioned in numberless pillboxes, tunnels, caves and trenches interspersed with snipers who were also equipped with supplies of grenades. Mines, anti-personnel, anti-tank, dotted the beach, and travel routes were interrupted by deep ditches. Booby traps were thick. The island was a network of trenches which disappeared into caves, criss-crossed, disappeared in tunnels.

The coastal defense guns were elaborately concealed, some on tracks which led from the firing position into a deep cave or tunnel; fire, roll back, reload, roll out to fire again. In the words of Richard Wheeler in his excellent 1980 book, *IWO*, "Working under enormous difficulties, the defenders had succeeded in turning Iwo Jima, an obscure bit of volcanic rock and sand, into what was probably the most ingenious fortress the world had ever seen." The positioning of weapons was such that practically every square foot of the island surface could be brought under fire.

Continued on next page

Typical terrain on most of Iwo Jima. "Few places on the Earth were uglier or more uninviting than Iwo Jima. It looked like a volcanic waste dump, which is exactly what it is."

The island Commander, LtGen. Tadimichi Kuribayashi, had his headquarters on the northern tip of the island. The General's headquarters consisted of a huge communications block house, reinforced concrete walls 5-feet thick, roof 10-foot thick. The radio room, 75 feet below, was a system of tunnels which served as quarters for the General and his staff. Hitler would have been envious.

Few places on the Earth were uglier or more uninviting than Iwo Jima. It looked like a volcanic waste dump, which is exactly what it is. Sulfur vapors rose from vents, fissures created by volcanic activity which produced steaming fumaroles, which later led to the Seabee claim that they built the only steam-heated runway in the world.

Seabees at work on Iwo Jima in July 1945. They were from Naval Construction Battalion 62.

When General Kuribayashi learned on D-3 that an invasion fleet had left the Marianas, he wired Tokyo asking for naval support. He was told that it was too soon — that the Navy would leave Japan on April 1 and "drive the invaders back to the U.S. mainland." (Admiral Mittscher's Task Force 58 had just spent two days off Japan, bombing selected targets; this may have prompted the disappointing reply to Kuribayashi.) But, as it turned out, on April 1, U.S. Forces landed on Okinawa, postponing indefinitely any plans for "driving the invaders back to the mainland."

In every pillbox, cave, tunnel, and bunker there was posted the mimeographed copy of "Courageous Battle Vows," written by the General: "Above all we shall dedicate ourselves and our entire strength to the defense of this island; we shall grasp bombs, charge every tank and destroy them; we shall infiltrate into the midst of the enemy and annihilate them; with every salvo we will without fail, kill the enemy; each man will make it his duty to kill 10 of the enemy before dying; until we are destroyed to the last man we shall harass the enemy with guerilla tactics."

Every man among the defenders knew that he was doomed but this only made them more dangerous. The Commanding General wrote his wife in June, eight months before D-Day: "You must not expect my survival." (While he served as an embassy attache in Washington in the 20's, he had written home after a tour of the U.S.: "The U.S. is the last country in the world we should fight.")

The landing itself was practically unopposed, but when the landing force was ashore on the black sands of the volcanic island, the defenders let loose with all weapons. Casualties began to accumulate immediately. It was impossible to "dig in." Moving inland, the Marines found safer territory — but not much safer; and the Seabees were stuck on the beach, unloading cargo, moving equipment, preparing roadways, supply dumps. It was in this activity that the 133rd sustained heavy casualties: 13 officers, 233 enlisted men, including two officers and 37 E.M. KIA; 137 were evacuated because of wounds.

As the Marines moved away from the beach, they were constantly in need of ammunition; Seabees had the job of moving "ammo" supplies from beach dumps to the Marine front. A giant Seabee, SF3c John Butts, of Salt Lake City made four heavy ammo case deliveries; he was killed on his fifth trip. Other Seabees took over his job.

Specially trained Seabees probed for and destroyed the mines they found on the beach. Tangles of debris were blown up to facilitate beach access. Among the most important Seabees were the bulldozer operators; towing wheeled vehicles out of the beach sand, driving roadways through the sand; building revetments around supply dumps.

South Airfield, 700 yards inland, was still in enemy hands in the early afternoon of D-Day, and at the far right sector of the beach, the 4th Marine Division was

up against heavy shelling from artillery pieces emplaced on the cliffs above the beach. Next day, the *Washington* eliminated them.

By the end of D-Day, 40,000 men were ashore; and the 5th Division had cut off Mt. Suribachi at the southern tip of the island from the defenders main forces. The cave-emplaced coastal defense gun on Suribachi inflicted heavy casualties on the Navy support force ships, and on the unloading operations on the beach, principally men of the 133rd NCB.

Cargo was being delivered and unloaded much faster than it could be moved inland to a supply dump. Routes to supply dumps were not marked; consequently, much material was deposited haphazardly. The glut on the beach made perfect targets for the guns on Suribachi as well as for the mortars about airfield No. 1. A seven-man manhandling a 37-mm gun off an LCVP ramp was struck with a mortar shell, wounding or killing all seven.

The beachmaster wrote later: "The beaches were clogged and unloading of high priority supplies was delayed by heavy cargo of low priority nature — lumber, cement, reinforcing steel; ice cream machines and heavy refrigeration machinery cannot be used ashore immediately and should be carried in a shipping echelon commensurate with their necessity."

These conditions permitted the defenders to inflict damage and casualties which slowed the operation; early estimates suggested a two- to three-week operation. It would take six weeks and even then, several thousand of the enemy were still operating in the north.

As the 40,000 Marines swung slowly northward from their line stretching across the island not far from the base of Suribachi, the contest developed a strange kind of battlefront. One side was fighting on the island surface, the other was out of sight, underground, often under the very ground the Marines were deployed upon. There was a line of departure, but from the air, only our side seemed to be occupied; the other side, unoccupied. When they did meet, it was often at close quarters, hand-to-hand; an evolution which favored the Marines.

Nine LCI's had been put out of action on D-1, 47 crewmen killed; the *USS Pensacola* took six hits in three minutes — 17 killed; *USS Tennessee* sustained one hit. On D+2, Kamikaze attacks damaged the *USS Saratoga* (300 killed or wounded) so extensively she was sent back to Pearl Harbor. The *USS Bismark Sea* was hit, exploded and sank with 200 of her crew. The flagship of Admiral Turner with SECNAV Forrester aboard was undamaged, but Suribachi's armory was put out of business on D+4.

On D+4, the 3rd Platoon, Easy Co., 2nd Battalion of the 28th Marines succeeded to the summit of Suribachi. They raised the flag; it was too small to be seen from any distance. A second flag, 4′ x 8′, was obtained from LST 779, and its raising on that 23rd day of February 1945 generated a roar from all

On Iwo Jima's treacherous beaches, where the soft volcanic sand collapsed into fox holes, shelters were built above ground of sand bags. Seabee Albert C. Jones, then 44 years old, and Machinists Mate Third Class, of Detroit, Mich., puts the finishing touches on his fox hole.

Americans on the island and all ships in the area; ships' whistles and bells joined in. It lifted the spirits of everyone; the photograph of the flag-raising became one of the great pictures of our time. The defenders no longer had the high ground advantage.

The 31st NCB began work on south airfield on D+5. The 61st began to come ashore on that day and as their number grew, they took over the job; 31st NCB began construction of facilities in the southern part of the island; they also started surveying for a roadway up Suribachi.

The 133rd was still engaged in sorting and transporting cargo and material inland to the place where it was needed. In the 5th Amphibious Corps planning prior to D-Day, the unloading target figure was set at 6,600 measured tons/day. This figure was never reached. The 133rd furnished work parties for unloading, transporting, dozing distribution roads and sites. The work became critical when the 31st and 62nd began their construction operations. Without sufficient equipment and material, progress fell behind target dates.

By that time 50,000 Marines had been put ashore. Two regiments of the 3rd Division, which had been held in reserve by General Smith, joined the 4th and 5th Divisions, assigned to a central position between them for the drive to the north. The remaining 3rd Division Regiment was later requested by General Schmidt, but Admiral Turner and General Smith decided against it; the invasion of Okinawa was just

Paved parking area on the central airfield, Iwo Jima.

During mopping up activity, many of the enemy had to be "dug out" of caves.

NCB-62 equipment north of central airstrip.

Central Field with Mount Suribachi in the background.

36 days in the future.

South airfield was cleared of mines by Seabee volunteers. On hands and knees for the length and breadth of the runway, Seabees removed shrapnel and bomb fragments so that planes could land without blowing a tire. South airfield was put in commission on March 3 when hospital and mail planes arrived from the Marianas.

The base development plan called for the development of Iwo Jima as an airbase; three airfields; tank farms; 20 miles of primary roads, 40 miles of secondary; a general hospital, field hospital and station hospital; air-warning system; fighter control and director stations; bomb and ammo storage; water supply system; small naval base and harbor — placing of block ships, breakwater, piers and quay walls. And of course housing and messing facilities (for 37,000) warehousing, storage yards, and 27,000 cubic feet of refrigerated storage. (The harbor facilities were not built.)

On D+6, all three Marine Division Headquarters came ashore, along with 5th Amphibious Corps Commander, General Harry Schmidt; and Captain R. C. Johnson, CEC, the top Seabee, OIC, 9th Construction Brigade.

On D+8, General Kuribayashi radioed Tokyo: "We are at 50 percent of original strength, 2/3 officers are gone, most machine guns and 60 percent big guns — all gone. Half the island has been lost."

In the furious pace of construction, accidents occurred. On April 16, a dump truck carrying 10 men from the 106th NCB (8th regiment) struck a land mine. All 10 were killed outright or died of wounds. On April 24, a landing B-29 crashed into a motor grader and a roller; both operators escaped injury. The B-29 and two fighter planes were consumed by the ensuing fire.

On April 26, an ammo dump near Suribachi caught fire, spread to 23rd Special Battalion supply dump. There were few casualties.

During the early stages of construction, one officer was killed by a plane while making a survey of south field. During construction, security patrols of the 62nd NCB killed or captured 150 of the enemy. Fulton O. Smith, operating a motor grader, had the grader's exhaust stack knocked off by an airborne P-51 Mustang. Smith was uninjured.

Pfc Jacklyn Lucas won the Medal of Honor on D-Day. An enemy grenade fell amidst his group. In a reflex act, he threw himself upon it. At that point, another landed beside him. He gathered it in, too. He was greviously wounded but miraculously survived. Five months later, he received the Medal of Honor at the White House; one of 27 awarded in the Battle for Iwo Jima.

One Marine was attacked by a sword-wielding officer. The Marine managed to grasp the sword in both

Seabees of the 31st NCB build a road on the side of Mount Suribachi.

hands, wrest it from the wielder, and killed him with his own sword. The Marine was hospitalized with two badly lacerated hands — and one enemy sword.

Medical Corps support of the Iwo Jima operation was superb; 214 medical corps officers, 2,653 corpsmen were committed. Between March 3 and 20, an average of 124 patients per day were evacuated by air; a total of 125 plane loads. The first hospital ship arrived on February 20 (D+1); the last departed March 14 (D+23).

During this period of 22 days, a total of eight hospital ships, two of which made round trips, and the reserve hospital LSV *Ozark* were filled to capacity. This was in addition to the capacity loads taken out by transports and LST(H) ships.

When Goebels learned of Roosevelt's passing, he hysterically told Hitler "This is the turning point! It is written in the stars."

Two medical officers and 141 corpsmen were killed in action; 14 corpsmen listed as missing. Nine officers and 567 corpsmen were wounded.

Central airfield was put into limited service on March 15. The first hot meals: March 17. NCB 62 eventually moved three million cubic yards in the reconstruction of the central airfield.

The island was declared secure on March 16. During the next three nights, 450 infiltrators were killed. The nightly raids continued despite the losses. On March 18, the 4th Marine Division boarded ship for return to Maui, T.H. On D+35, the 8th regiment, 9th N.C. Brigade arrived.

March 20 marked the arrival of the army's 147th infantry regiment. They were placed under operational control of the 3rd Marine Division. On March 24, Admiral Nimitz visited the island. He told the troops that their efforts had saved 65 B-29 bombers and their crew.

That number would climb steadily until the Enola Gay overflew Iwo on its way to Hiroshima. By that time, a total of 2,251 distressed superforts carrying 24,767 crewmen had landed on the longest runway in the Pacific. The value of the Seabee contribution to victory in the Pacific was enormous.

The defenders made a final effort at 5 a.m. on the morning of March 27. Three hundred of the defenders led by General Kuribayashi attacked unit camps located near the Central Airfield. Units sustaining casualties were the Marine 5th Pioneer Battalion and the 98th NCB. Two Seabees were killed; total U.S. losses: 50 KIA, 100 wounded. Most of the attacking force was killed. General Kuribayashi committed hari-kari later that day.

Cdr. Ray P. Murphy, C. O. of 133rd NCB, taken after battle with lights too bright and cap too tight.

The 5th Division boarded ship March 26-27; General Schmidt left the island on March 26 and the 5th Amphibious Corps was out of business. "This was the worst one" was the General's evaluation of the Battle of Iwo Jima. Marine casualties had been very heavy.

During mopping up activity, the 147th Infantry Regiment killed 1,602 enemy and took 867 more prisoners; most were starving.

Six hundred miles to the west, the battle for Okinawa began on April 1. On Iwo Jima, Seabees moved into permanent camps on D+44.

GI's around the world were saddened by the death of their commander-in-chief, President Roosevelt, on April 12, 1945. He had been in poor health for some time, but no one was prepared for his passing. Aside from the deep sense of loss, it seemed that, at practically the moment of total victory, he was cheated out of witnessing the unconditional surrender of those who had perpetrated that "day of infamy" in

Now a Captain, seven years later in 1952, Murphy went to Calif. Div. of Highways. (no relation to author)

The Seabees looked like old men — some were grandfathers and some fathers

December of 1941.

When Goebels, Hitler's sub-human propaganda minister, learned of Roosevelt's passing, he hysterically told Hitler "this is the turning point! It is written in the stars," etc., in the astrological manner of the Hitler crew. Two weeks later, he killed his children, his wife and himself. Hitler was a suicide on April 29. (Two days earlier Mussolini had been captured and executed by Italian partisans.)

A week later, General Jodl signed the surrender documents — unconditional surrender — and the war which was generated and sustained for seven years by a psycopath — the bastard son of Maria Schicklgruber — was at an end. What a much better place the world would be if she had practiced birth control . . . . The "Thousand Year Reich" lasted 12 years.

So much for the "Master Race." As for the Axis — two down and one to go.

On the island of Ie, off Okinawa, during the last battle of the Pacific war, Ernie Pyle was killed. He was the most widely read, respected correspondent in the war; beloved by soldiers and home folks alike. He had been with the GIs from Anzio to Okinawa, and he was always up front where the fighting was. And that's where he was on April 18, 1945. He had no equal.

The 133rd NCB assembled the rock crushing plant which operated on a two-shift schedule, producing 60 tons per hour. Snipers persisted in an attempt to halt production; no casualties resulted.

The battalion also built the Skyline Theater, which became the scene of ceremonies, entertainment and church services. Cardinal Spellman said mass there.

On May 19, the hot-mix plant was put into production. The plant had a rated production of 80-120 tons/hours but the 133rd pushed 130 tons/hours through it. Before they were through, they had produced 150,000 tons of asphalt-concrete paving. If the war had lasted another month, the whole island might have been black-topped; which would have been an improvement.

The Seabees built the longest (1.86 miles) paved runway in the Pacific. Central Airfield was 200-feet wide; it was completed July 12. In addition to the airfield runways, the equivalent of 55 miles of two-lane roadway was put down. Daily production reached a peak of 13,700 lineal feet of 10-foot wide surfacing. The plant was twice struck by 250 lb bombs; damage was slight and production was not seriously affected. The two central tank farms: east — 80,000 bbls AVGAS; WEST — 160,000 BBLS

On Feb. 23, 1945 at 10:20 a.m., the U.S. Marines raised the American flag again — a larger one this time — on top of Mount Suribachi. In this now famous photograph, and later a famous sculpture by sculptor Felix de Weldon, the flag is raised by (from left) Privates First Class Ira H. Hayes and Franklin R. Sousley (killed in action); Sergeant Michael Strank (killed in action); Pharmacist Mate 2/C John H. Bradley; Private First Class Rene A. Gagnon and Corporal Harlon H. Block (killed in action). This photograph by A. P.s Joe Rosenthal, has become as famous as the battle was historic.

U.S. Marines prepare for the first flag raising on Iwo Jima. (Photo inset shows first flag raised).

AVGAS, gasoline and diesel fuel, were not hit.

On June 21 Okinawa was surrendered and the door to Japan was open, wide open; and the plans for operation *Olympic* (for the invasion of Japan) had been finalized.

Late in June, certain 42-year-old Seabees began returning to the states for separation. These old-timers, masters of their construction crafts, were largely responsible for the remarkable achievements of the Seabees wherever they were sent. Compared to shipboard sailors Seabees looked like old men. There were more grandfathers in some than there were fathers on many ships, but they were tough. Their skills were not GI — they came with the man. They "made" the Seabees.

Change Order No. 7, issued in July, increased the construction work by 95% (it never fails). At south field, additional parking space was provided to accommodate 258 planes and runways were extended. At central, the east-west runway was converted to a fueling strip and widened from 200 to 570 feet; fueling outlets increased from 30 to 60, and parallel strips were extended from 8,500 to 9,800 feet; warm-up aprons, taxiways, service aprons and hardstands added to match (by this time, there were probably a few Seabee-built stills in operation on the island; Article I of the Seabee Bill of Rites).

On July 23, 186 B-29's landed, being the greatest number to date.

In July, one of the battalions was given a strange and unusual project with an *urgent* label. It amounted to a sizable pit off the central runway but connected to it by a Marston mat taxiway, plus a special hardstand. Unknown to the Seabees, the purpose of the project was to permit the Enola Gay, in case of engine trouble, to land, deposit the "Thin Man" for transfer to another B-29.

No such emergency developed and at 15 minutes past dawn on August 6 (August 5 at home) the Enola Gay and two escorting B-29's flew over Iwo Jima bound for Hiroshima. The bomb was dropped at 9:15 a.m. Almost directly below the point of detonation, the Japanese 2nd Army was engaged in calisthenics.

Four days later on August 10, Japan sent messages accepting the terms of the Potsdam Declaration, i.e., unconditional surrender, to London, Chungking, Moscow, and Washington. President Truman announced it on August 13, at 7 p.m., declaring a two-day national holiday.

When the President made the announcement, Admiral Ben Moreell stood with the Seabees on Iwo Jima. It was fitting that the man who had created the Seabees — the fighting construction men who contributed so much to victory in the Pacific — was with them at the end. There was pride enough to go around.

During the Battle of Iwo Jima, over 200 members of the 133rd Battalion were awarded Purple Hearts; 10 won Bronze Stars.

For its work on the beach on D-Day and for it subsequent construction operations, the 133rd NCB received the Navy Unit Commendation . . . . . The Battalion was recommissioned on August 15, 1966. It won the Peltier Award — Best of Type — in 1980 and again in 1982. Their achievements are impressive indeed.

Captain Raymond P. Murphy, who commanded the battalion during the battle for Iwo Jima, was present at the recommissioning. He assisted in the preparation of this account. He graduated from U.C. Berkeley, BSCE, 1931; became Associate Bridge Engineer, California Division of Highways; served as RCBPO, 12nd, from November 1951 to November 1953. □

Indianapolis crew lost — never saw victory

By TED C. MURPHY

The activity of the heavy cruiser *Indianapolis, CA-35,* led directly to the abrupt end of WWII in July, 1945. Yet no ship came to a more tragic end; she was lost with 879 of her officers and men just 10 days before Japan surrendered. And they died without knowing what they had done to bring a quick end to the war, saving countless thousands who would have died in a planned final step in the prosecution of the war: the invasion of Japan, set for October, 1945.

The ship was in drydock at Mare Island having the damage suffered in a kamikaze attack of Okinawa (in March) repaired when Captain Charles Butler McKay, III, was told to have the ship ready for sea in four days. At 8:30 a.m., July 16, she put to sea; strange-looking cargo crates had been brought aboard by two army officers. A two-man 24-hour Marine watch was posted on the deck cargo; none of the crew, including the captain, knew what the cargo was. It was delivered to Tinian, Marianas Islands, on July 26, 1945.

On July 29, CA-35 was ordered to Leyte. At one minute after midnight, she was struck by two torpedoes and sank within 15 minutes. About 850 men of her crew of 1196 got into the water alive. But tragically, the ship was not missed; her arrival time at Leyte passed unnoticed. Her SOS never registered.

Some of the crew had been badly injured; they were the first to die. The shark infestation was described as the worst ever seen. Many of the men were in the water, kept afloat by life jackets. There was no food; what little water they had soon was consumed. They watched ships pass, aircraft fly over, but no one discovered them — until, after five days they were finally sighted.

When the rescue operation was completed, only 317 men were still alive; more than 500 had died after they had gone into the water.

Less than three days after the rescue, the cargo they had carried to Tinian was dropped on Hiroshima. The war ended almost immediately; ironically, for the crew of CA-35.

While their activity undoubtedly saved many thousands of lives, their fate was to become the worst open sea disaster in American Naval History; 879 officers and men lost their lives — with the war's end only a few days away.

27 new grads assigned worldwide

Twenty-seven new officers were accepted into the ranks of the U.S. Navy's Civil Engineer Corps on March 8, 1985, upon graduation from the Naval School, Civil Engineer Corps Officers, Port Hueneme, Calif., and have accepted assignments all over the world.

Class Number 174 completed eight weeks of specialized training pertinent to the navy's needs for shore installation, engineering, public works management, and Seabee operations.

Five officers graduated with honors. Lt.(jg) Michael J. Sherbak was the outstanding graduate. Four others graduated with distinction: Ens. Mary K. Baldwin, Lt. Joel A. Clark, Ens. Timothy P. O'Rourke and Ens. Jorge N. Rendon.

Lt. Sherbak's photograph is indicated by (★). Those graduating with distinction are indicated by (•) and those entering Seabee duty by (†).

•★Ltjg. Michael J. Sherbak
BSME/Univ. of So. Carolina
to Jacksonville, Fla.

Ens. Michael K. Abate
BSE/Univ. of Penny
to Sigonella, Italy

•Ens. Mary K. Baldwin
BSME/Clemson Univ.
to Guam

MIP — A bold concept

By LT H. D. TAUNTON, CEC, USN

An innovative management experiment has been devised by the Office of the Secretary of Defense to improve working and living conditions on military installations. The program, which is called "Model Installation Program," or MIP for short, provides an avenue for trying new work or procedural methods proposed by station personnel. It allows the station to retain any savings generated to improve the station's facilities and services.

As stated by the DoD MIP coordinators, over centralization impedes an installation commander's ability to command. Through the years, the once effective operational chain of command has grown into a network of integrated staffs presetting the decisions instead of making recommendations to the commanding officers and allowing them to make the decisions.

In the words of the DoD MIP Coordinator, "Too many people are making decisions who have no interest in the result."

The Model Installation Program is a bold concept aimed directly at the heart of the stumbling block to progress encountered by all installation commanders. That stumbling block is the voluminous amount of regulatory restrictions that prevent an installation from achieving its goals for improvement in a timely manner.

The Department of Defense discovered that the installation commanders, our top personnel in the services, really had very little flexibility in the operation of their installations.

Regulation after regulation restricted the decision-making ability of the commanding officers.

The Model Installation Program is the hammer by which the Station Commander can break through that regulatory barrier. During the program, the installation commanders are given more authority to operate their bases.

The Department of Defense as well as the service secretaries have the necessary authority to waive regulations as requested by the Model Installation commanders. Temporary statutory relief may be requested from Congress, but due to the legal process the waiver may take longer to be realized.

Interestingly enough, DoD discovered that 90 percent of the restrictive regulations were service-generated and not DoD established. This puts the approval level for most waiver requests within the service arena.

The Model Installation Program is:

- Developing and promulgating better techniques for installation operation.
- Identifying and eliminating wasteful procedures and regulations.
- Giving station commanders the authority to do their job.
- Creating a better work and living environment which improves morale, performance, and retention.

Presently, 27 installations are participating in MIP with more to come. The 15 original installations chosen from among all services, are: Fort Sill, Okla.; Aberdeen Proving Ground, Md.; Anniston Army Dept., Ala.; Fort Polk, La.; U.S. Army Support Command, Hawaii; Moody Air Force Base, Texas; Hickam Air Force Base, Hawaii; Whiteman Air Force Base, Mo.; Naval Training Center, Great Lakes, Ill.; Naval Air Station, Meridian, Miss.; Naval Air Station, Alameda, Calif.; Marine Corps Air Station, El Toro, Calif.; and Marine Corps Logistics Base, Albany, Ga.

The following installations were added to the initial 15 base MIP effective January 1985; U.S. Military Community Activity, Hanau, Germany; U.S. Military Community, Neu Uln, Germany; New Cumberland Army Depot, Pennsylvania; Naval Station, Rota, Spain; Marine Corps Air Station, Iwakuni, Japan; Marine Corps Base, Camp Lejeune, North Carolina; Fairchild Air Force Base, Washington; Kessler Air Force Base, Mississippi; Royal Air Force Lakeenheath, United Kingdom; Langley Air Force Base, Va., and McGuire Air Force Base, N.J.

Waiver requests from these installations are submitted via a special mes-

sage format to the service headquarters. The response to the request must be returned within 72 hours if possible. The DoD position at present is "Let 'em try it and see if it works." The waiver request can only be denied by a flag officer. Requests can cover any aspect of base operations and may be submitted by any person on the installation via a MIP coordination point.

There are really only three major rules for the program.

- You can't violate a law.
- You can't terminate employment of personnel or violate union agreements.
- You must be able to operate with already established resources.

Basically, other than these, "The sky is the limit." The big benefits are not only a more efficient organization but any savings generated by an approved MIP request (and this can be significant) can be utilized wherever the installation commander sees fit. Now that's incentive!

Is the Model Installation Program a dream come true? Well, maybe not quite, but it provides an avenue for the individual to make a difference — that is where it counts! A chance to tap your greatest resource . . . people!

situation report

Construction Battalion Units (CBUs) consist of a junior CEC officer and 35-60 Seabees and are assigned to several activities throughout the United States. The mission of the CBUs is to provide a contingency construction augment capability to the Naval Construction Force (NCF), to provide individual military and technical skill training, and to undertake various construction projects in support of the activity Commanding Officer.

Five new CBUs, located at Newport, R.I.; Long Beach, Calif.; Washington, D.C.; Mayport, Fla.; and Mare Island, Calif., will be commissioned in fiscal Year 1985 and 1986, joining the other 17 already serving the Navy.

The Navy continues to test the Section 801/802 alternative housing acquisition programs. These programs provide for the lease/construction or rental guarantee of up to 1200 units of housing for Navy families and personnel. Results at our first three test locations, San Diego, Calif., Long Beach, Calif., and Earle, N.J., were disappointing.

The availability of privately owned land and the costs associated with the development of a private housing project in the high cost areas around the major naval activities precluded successful bids. The fourth test locations, Norfolk, Va., has received a number of competitive proposals. Technical evaluation and cost analysis of those proposals are proceeding on schedule.

The Congress is presently reviewing a DOD proposal to extend the program for a year. This would permit additional testing at other Navy activities where the use of Navy-owned or controlled land is likely to reduce the overall project costs. This should in turn provide sufficient incentive to potential bidders. In anticipation of a receipt of an extension from the Congress, NAVFAC has been working with EFD's and activities to prioritize a list of follow-on candidate locations for FY 86.

Northern Division is the prototype site for implementing distributed processing for Engineering Field Divisions. In May 1985, an IBM Model 4331 minicomputer system was installed including disk storage, local CRTs, high speed communications facilities for direct connection with FACSO, and low-speed communications facilities for dial-up access by remote ROICCs. Sophisticated data base management system software for standard (FACSO developed) applications is included; this software can also be used for EFD

Continued on next page

Lt. Ronald S. Barr
BSME/Auburn
to Memphis, Tenn.

•Lt. Joel A. Clark
BS Struct/Cornell Univ.
to Norfolk, Va.

†Ens. William F. Cords
BSCEE/Univ. of Wisc.
to Port Hueneme, Calif.

Ens. Daniel H. Cross
BSCE/Univ. of Minn.
to San Vito, Italy

Ens. Henry V. Dobson, Jr.
BSCHE/Univ. of Florida
to Orlando, Fla.

Ens. Curtis A. Frye
BS Petrol. E./Penn State Univ.
to Lakehurst, New Jersey

Ens. James E. Gentry, Jr.
BSCE/Case Western Res U.
to Washington, D.C.

Ens. John J. Giroux
BSCE/Michigan State Univ.
to Colts Neck, New Jersey

Ens. Gary T. Hobson
BSOE/U.S. Naval Academy
to Pearl Harbor, Hawaii

Ens. Randall J. Johnston
BE/Youngstown State Univ.
to Warminster, Penn.

Ens. William T. King
BSCE/Michigan State Univ.
to Jacksonville, Fla.

Ens. Christopher H. Kiwus
BSCE/Union College
to Point Mugu, Calif.

Ens. Willington Lin
BSCE/Univ. of Maryland
to Cecil Field, Fla.

•Ens. Timothy P. O'Rourke
BS Trans/Michigan State U.
to Monterey, Calif.

Ens. William A. Oster
BSCE/Penn State Univ.
to Quantico, Va.

Lt. Dan A. Reidenbach
BSME/Univ. of New Mexico
to Sigonella, Italy

•Ens. Jorge N. Rendon
BSCE/Temple Univ.
to Mayport, Fla.

†Ens. Carlos I. Rivera
BSME/U.S. Naval Academy
to Gulfport, Miss.

Ens. Paul M. Rose
BSCE/Ohio North. Univ.
to Chase Field, Texas

Ens. Val C. Runge
BSCE/Univ. of Wisc.
to Lemoore, Calif.

Ens. Valerie L. Schaffner
BSME/Univ. of Missouri
to Philippines

Ens. Kevin R. Sommers
BSCE/Lawrence Inst. of Tech.
to Little Creek, Va.

Ens. Vernon R. Turner
BSCE/Montana State Univ.
to Silverdale, Wash.

Ens. David K. Weil
BSCE/San Diego State Univ.
to Pearl Harbor, Hawaii

situation report (continued from page 23)

development of activity unique applications.

NORTHDIV's portion of the central data base including the suspense, history, and selected "DYL-Files" are being downloaded for local online querying and report generation. Interfacing with the WANG OIS and "pass-thru" CRT communications to other FACSO centrally processed applications are part of the prototype test. Predicated upon prototype evaluation and acceptance, similar minicomputer systems will be installed at the remaining EFDs on a phased basis over the next two years.

A special attempt is being made by Ms. Rhonda Bish in the CEC detailing office (NMPC-4413T) to update statistics pertaining to officer licensing as a professional engineer or registered architect.

To assist with this please review your microfiche and check the P-1 to ensure your records are up to date. The address to which you may write to obtain a copy of your official record is: Commander, Naval Military Personnel Command, NMPC-312, Navy Annex, Washington, D.C. 20370. Listing in the P-1 does not necessarily mean that the registration certificate is filed in your official record.

Submission of the card from the P-1 does not ensure your records are current unless a copy of the actual certificate is submitted. Therefore, if your records do not reflect your current registration please send a photo copy of the certificate to the following address: Commander, Naval Military Personnel Command, NMPC-4413T, Navy Annex, Washington, D.C. 20370.

advice of counsel (continued from page 13)

problem, the better the likelihood of success in resolving the problem.

Similarly, the Navy should also monitor the local zoning commissions which grant variances to existing uses as such may also impact on the activity concerned.

In summary, the zoning process is a local government activity whose purpose is to provide information and organization for orderly development of lands, provide stabilization to land values and to prevent conflicts between land uses.

The Navy, as a landowner, has an inherent interest in the zoning process. Navy officials should be fully aware of the process and participate in zoning proceedings when there are sound, legitimate land use concerns connected with Navy management with its lands.

As part of a "good neighbor" policy, Navy officials should be candid about their reasons for zoning participation and the likely results of zoning. To avoid perceptions that Navy's motivation is to lower property values for subsequent land acquisition, Navy officials should stress the common land use concerns of the Navy and local parties (e.g. planned development that would be compatible for the overall economic growth and vitality of the area). The unsuitability of the land for specific zoning proposals should be highlighted.

As mentioned previously, local governments have, perhaps, the greatest influence in determining when, how, where and in what manner private property will be used. The Navy should make full use of and act as a full partner in the zoning process. This can only be achieved, however, if it is understood, actively reviewed and used. □

Got the urge to write about your job, project, discoveries, accomplishments, or . . .?

We are now accepting articles for the Spring issue and will observe December 10, 1985 as the deadline for material. Questions? Call AUTO 360-3104.

Diver Tools Program

New tools for underwater work

By JERRY THOMAS

Navy divers have evolved into skilled underwater technicians. They have assumed more complex assignments, heavier workloads, and tasks that have taken them into greater depths.

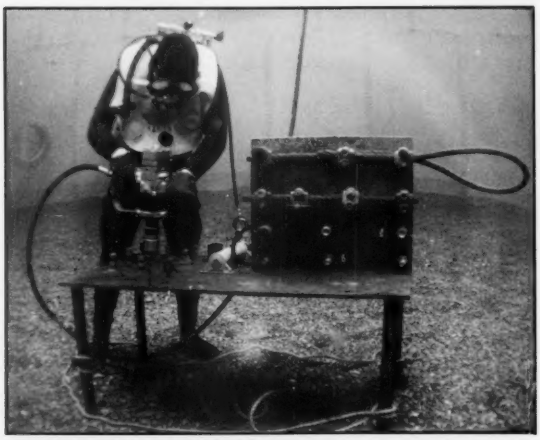
For almost 20 years, divers have been relying largely upon the Naval Civil Engineering Laboratory (NCEL), Port Hueneme, Calif., for the newest technology and hardware. To support their needs for greater efficiency and productivity, the Laboratory has been developing new tools, techniques and power sources.

Today's divers must adapt to extreme underwater environments, from arctic to tropic, and adjust to various surface support systems, from small inflatables to larger diving vessels expressly equipped to support their work.

NCEL is confident that the technology it develops today will lead to improved capabilities for tomorrow, enabling all classifications of divers (construction, maintenance, repair, rescue, salvage, saturation) to work faster, more safely, and with more freedom of movement. They will be able to meet their technical responsibilities by using new generations of tools, procedures and power systems developed under the Laboratory's Diver Tools Program.

The Diver Tools Program today uses the talents of six engineers and two technicians. Sponsored by the Naval Facilities Engineering Command, and the Naval Sea Systems Command, the $2 million program concentrates on two major areas of development, Technology and Hardware.

Within the Diver Tools Program, the Underwater Construction Systems (UCS) project is development a multi-function tool system, grout dispenser, emergency diver recall system, diver navigation and survey system, underwater work repair manual, geotechnical tools, metal detectors, oil- and seawater-powered lightweight hydraulic power supplies mounted on an inflatable boat, and a cable tracking system.



Diver operates prototype seawater hydraulic impact wrench in NCEL's shallow-water test tank. The tool is powered by a 3hp motor. Only one hose is required because the return fluid is conveniently exhausted into the surrounding water. At the right is a steel panel with various test bolts in place.

NCEL was named lead laboratory two years ago for the UCS project. The Laboratory's Ocean Systems and Seafloor Engineering Divisions are conducting 16 projects to assist divers in overcoming limitations imposed by equipment not specifically designed for them and the tasks they must perform.

Project Leader Stanley Black said new developments in underwater tools systems incorporate the latest technology. Under the program, NCEL's recently developed seawater hydraulic motor is being adapted to the multi-function tool system. The system consists of a seawater power source and four tools: rock drill, rotary impact wrench and drill, high-speed rotary abrasive disc, and portable bandsaw.

The system also features two design innovations never used previously by Navy Underwater Construction Teams. First, the tools are designed specifically for underwater construction; they are not simply modifications of tools originally designed for use on land. Also, the system is powered by pressurized seawater instead of pressurized oil. Seawater hydraulics is the newest advancement in power tools, Black said, providing a safe, clean and convenient source of working fluid. The system would be available to Navy divers by January, 1986.

Following are brief descriptions of the components of the multi-function tool system:

Seawater Power Supply — The full-duty 30hp Diesel-driven power source is capable of delivering 2,000 psi seawater at flow rates up to 14 gallons a minute. Skid-mounted on a trailer, the unit features a 50-foot inlet lift and can power two tools at the same time.

Rock Drill — The tool incorporates an interchangeable nose piece for light- and heavy-duty drilling. The light-duty drill produces holes 1/4-inch to 1½-inch in diameter. It can be operated to water depths of 190 feet, drilling 3/4-inch diameter holes in granite at a rate of three to four inches a minute. Using the heavy-duty drill, divers can drill holes up to 3½-inches in diameter. The tool can be used at greater depths because none of the parts are ambient pressure sensitive.

Portable Bandsaw — Previously it took a team of divers, using a hand hacksaw, four to eight hours to cut through a double-armored 3½-inch diameter cable. With the portable hydraulic bandsaw developed by NCEL, divers can cut the cable in less than a minute.

High-Speed Rotary Abrasive Disc — This versatile tool can grind, clean and cut. Featuring an interchangeable arbor, it can be adapted as an abrasive saw, grinding wheel, or cleaning brush. It also cuts steel and aluminum underwater, as well as bolts, rebar, cable, and 1¼-inch synthetic lines. A safety guard minimizes viscous drag.

Rotary Impact Wrench and Drill — The tool provides maximum torque of 400-ft.-lbs. to tighten 5/8-inch bolts. It can be used to drill holes into wood and metal with drill sizes from 1/4-inch to 1-inch in diameter. Weighing 15 pounds, it can be operated in forward or reverse directions using commercially-available impact sockets and drill bits. Flow range is 4-10 gpm and the pressure range is 500-1500 psi.

In other areas of hardware development, Laboratory engineers have developed six geotechnical tools to assist divers in obtaining reliable geotechnical data. The tools are designed for scuba divers at a depth limit of 130 feet.

The tools — impact corer, miniature standard penetration tester, vane shear, rock classifier, vacuum corer, and jet probe — will be available next summer. They will enable divers to gather in-situ data and take samples for laboratory testing. Data and test results will be instrumental in the design and installation of a variety of seafloor facilities.

Black said prototypes of the tools have performed well when tested by NCEL divers on several projects. Tests have provided worthwhile geotechnical data.

The Laboratory's Ocean Systems Division also has developed the following:

Grout Dispenser — The tool provides the diver an improved technique to simultaneously mix and dispense two-part epoxies from disposable cartridges during installation of rebar anchor bolts in soft, porous coral. The diver-operated dispenser, simple and safe to operate, increases grouting rates. Holding capabilities in excess of 40,000 pounds can be achieved for rebar grouted with epoxy in concrete block.

Emergency Diver Recall System — The Benthos Diver Signaling System has been modified to produce an emergency diver call system more suitable for Navy divers. The battery-operated device transmits voice and alarm signals directly through the water. The system consists of an underwater transducer connected to the audio control unit by a 25-foot shielded, waterproof cable. The alarm signal can be heard to recall distances of more than 300 yards in both open water and harbor environments.

A new seawater hydraulic band saw for cutting armored cable and pipe up to four inches in diameter. The one-of-a-kind tool is an improved version of the Laboratory's oil hydraulic saw. It can cut through a 3½-inch diameter double-armored cable in approximately one minute.

Cable Tracking System — This device locates and tracks buried and surface laid submarine communication cables. The system consists of a diver probe, a surface signal injector, and a submersible signal injector. A hand-held electronic probe detects the presence of a 25-hertz magnetic field. Depending upon the strength of the impressed signal, the probe can track the cable's exact location from several hundred feet away. The tracking tone is impressed by either the surface or submersible signal injectors.

Saturation Diver Tools Package Program — Participating in a program with the Naval Ocean Systems Center, Hawaii, NCEL is developing a completely self-contained tool package to be deployed to depths of 1,000 feet that increases the saturation diver's working capabilities. The primary missions include submarine rescue, deep ocean salvage, and deep ocean recovery. The tool package consists of five basic subsystems: a silver-zinc battery pack to provide primary power to the package, a submersible electric DC motor, an hydraulic converter unit using a waterbased working fluid, an electronic monitoring system, and the tools. The package features special design precautions to protect against accidental hydraulic fluid contamination from the system's tools. The battery pack contains 40 cells (60 volts) and provides a total power delivery of 350 amp-hours.

Underwater Work Repair Techniques Manual — The manual was developed to increase the effectiveness of Underwater Construction Teams and help divers plan and perform future work. The manual, available in January, is based upon Navy diver experiences and applicable commercial practices. It is primarily designed to provide general information but does contain specific information on selected subjects. The publication covers work techniques, operational procedures, and assists (by examples) in the planning and estimating of resources and time.

Lightweight Oil Hydraulic Power Supply — This power source allows divers to operate hydraulic tools from an inflatable boat. The supply consists of hydraulic components (pumps, filters, valves, etc.) driven by a 35hp outboard motor mountable on the transom of the boat. Power source controls are located inside the boat.

Diver Electrical Safety Systems — This program is developing safe electrical power transmission systems for Navy divers. The use of electrical power underwater requires an improved ground fault detection system. The developed detection and shutdown system will remove all power from the transmission line in less than 10 milliseconds if the insulation resistance of the electrical load drops below 50,000 ohms. Systems have been tested for use with 120 Vac single-phase, and 220 Vac three-phase, at power levels up to 25kW. Also, an underwater electric field detector has been developed to allow divers to survey equipment, not protected by a ground fault system, for potentially hazardous leakage currents. □

By LCDR GERARD JUDE BARRETT, CEC, USN
P. E., Guam, Pa.
Defense Nuclear Agency
Washington, D.C.

Public Works is certainly a descriptive term for the functions we perform aboard a shore station, but it often brings to the mind of those we serve an unwieldy, slow moving, self-serving, nonresponsive organization. This image has generated much discussion over the past few years. Let's take a look at this perception and see if we can't arrive at some realistic conclusions, and devise a strategy to change that often preconceived negative perception.

Generally, why is Public Works perceived in an unfavorable light? Is it because of the actions of our officers or civilian supervisors, or the lack of it? Have you ever had a discussion with your commanding officer or other non-Civil Engineer Corps officer and had Public Works berated? It wasn't you personally or the many excellent people on your staff who were berated, but that "entity" called Public Works.

These negative perceptions are often deep rooted. Somehow, somewhere these individuals may not have been properly treated, perhaps as a lieutenant junior grade when assigned housing with a leaky roof, or as a lieutenant when they couldn't get a Public Works carry-all when their ship pulled in, or as a lieutenant commander they couldn't get adequate cold-iron support upon return from a long deployment. Now as a line officer department head, or executive officer ashore, they learn that even when the commanding officer orders "right full rudder" in facilities' matters, generally a very slow course change occurs.

It is our job to know the commanding officer's priorities and to carry them out effectively in accordance with guidelines set out for us in instructions, manuals, and law. An explanation of this "system" often goes a long way toward a successful relationship, then often understood only by the commanding officer, his executive officer, and the supply/comptroller, who in many cases has similar problems. However, this explanation doesn't appreciably alter the built-up negative perceptions of the past for all others who are the majority of whom we serve.

Improvement of the image of the past is something which requires continuous effort. This is not aided, as we found out at many of our activities, where efficiencies from an engineering management viewpoint were our only concerns.

We all know that "We Exist to Serve the Fleet." We have a captive clientele, but our goal is to do our utmost to be responsive to them and to keep them informed as to when and why we can't.

PERCEPTIONS AND STRATEGY

Rear Admiral Jones commented in the 1982 summer issue of the *Navy Civil Engineer* that "When what you do and how you do it is both very important and sensitive," as it is when dealing with quality of life issues, "you had better perform well, and be perceived as a good performer, or stand by for some sharp criticism." I cannot over-emphasize "perception," no matter how fine-tuned or responsive your organization is, on paper or otherwise.

Public Works is big business. A look at any station's budget will confirm that. Many of us though, manage that business from an engineering/management perspective, often overlooking the "market strategies" so vitally needed to be successful facilities managers in the area of public relations.

I agree with Rear Admiral Jones in following the simple strategies of providing quality work, performed on time, investigating perceptions, and taking action to correct misperceptions or mismanagement.

Generally, all our personnel have that level of expertise required to be successful in facilities management. However, the area of customer services reflected through attitude and quality of work truly needs increased emphasis.

I recently came across a 1978 NAVFAC "Guide for Public Works Center Commanding Officers" which outlined the PWC's Ten Commandants for good business. I'll refer to them as "Working Level Guides" and suggest that they become a way of life for all of us in Public Works (Facilities Operations and Maintenance). They are simple concepts that can start us towards a better understanding by the Naval community.

> A Customer (consumer) is the most important person in our business.
>
> A Customer (no matter how captive) is not dependent on us — we are dependent on him/her.
>
> A Customer is not an interruption of our work — he/she is the reason for it.
>
> A Customer does us a favor when he calls us — we are not doing him/her a favor by serving him/her.
>
> A Customer is part of our business, not an outsider.
>
> A Customer is not a cold statistic — he/she is a human being with feelings and emotions like our own.
>
> A Customer is not someone to argue with, to match wits with.
>
> A Customer is a person who brings us his/her wants — it is our job to responsibly fill those wants through quality services.
>
> A Customer is deserving of the most courteous, attentive quality treatment we can give him/her.
>
> A Customer (consumer) is the lifeblood of this and every organization."

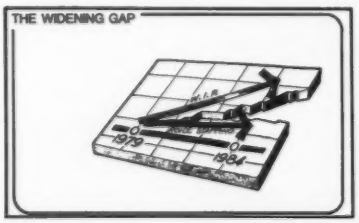
These Guides are useless unless understood and followed. This includes all levels of the "business" from the Emergency/Service desk to the Public Works Officer. Carry out a vigorous in-house campaign to make them viable, and the perception of our community cannot help but be improved. Let's show through our new understanding of our role, that we are truly the fine organization that we always inherently were. □

Introducing a new Q. A. plan called

NEAT

By JOHN M. DAVIS
P.E., Va.

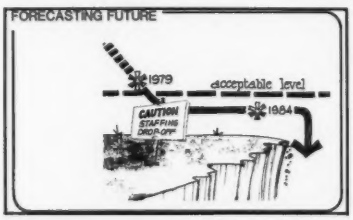
What do you do when your construction programs expand at the rate of 134 percent while the personnel resources to administer that workload increase by only a paltry 30 percent during the same period? All of us in the Naval Facilities Engineering Command (NAVFAC) family have faced this situation in one form or the other for varying periods of time ever since the terms "austere funding" and "scarce resources" became a part of our everyday vocabulary. The combination of semi-fixed personnel ceilings and other budget restraints has served to compound the situation in recent years, however, and has forced many managers to lose a lot of sleep and scrape the bottom of the barrel for new or innovative ideas in an attempt to survive.



The trick is to get more production out of your staff without sacrificing the quality of the end product. Achieving this goal is another matter! It became obvious to the managers in the Atlantic Division, NAVFAC, that we needed a plan of some sort for use by our Resident Officer in Charge of Construction (ROICC) offices that would allow the same number of people to cover a greater number of jobs without significantly affecting the quality of construction.

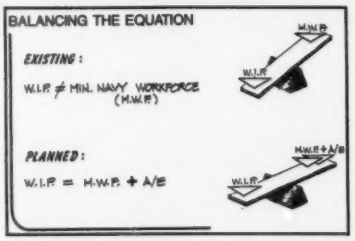
In other words, we needed an approach that assured us of a good product in spite of our deficiencies in staffing and budget allowances. The logical outgrowth of all these discussions was the determination to develop a Quality Assurance Plan (QAP) that we could test on an on-going project to determine its worth and effectiveness.

The heavy design and construction workload made it impractical to develop a QAP using in-house people, so we started thinking about an architect/engineer contract. The consensus seemed to be that the architect of record would be the best choice for supplemental support since that firm was already intimately familiar with the background, criteria and design approaches to the project.



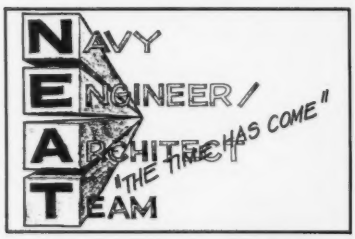
It would be a logical extension of design services and would hopefully give the architect/engineer (A/E) an added incentive by expanding the role during construction so that he or she would stay involved in the entire build-

ing process and not bow out after completion of plans and specifications as is usually the case (except for specific Title II services contacts).

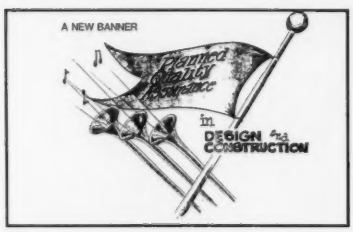


Thus was formed a new alliance, i.e., a "Navy-Engineer-Architect Team," or NEAT for short! Basically, the A/E would fill the void on the ROICC staff in technical areas as well as in general surveillance as needed to provide minimum oversight of construction.

We envisioned a three-part role for the A/E in formulating our plan: (1) developing the basic QAP concurrent with 35-100 percent design documents' preparation; (2) establishing a planned, coordinated series of site visitations during construction to assist the ROICC with both specific expertise and general observations; and (3) preparing an evaluation report of the effectiveness of the QAP both during construction and after the final product is completed.



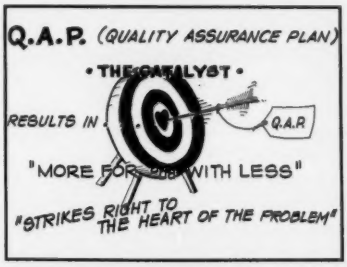
The A/E would provide recommendations for those events occurring during construction which were of sufficient import to warrant specific site visits by the designer to ensure conformance with plans and end user needs.



General site visits would hopefully help to avoid future problems by enabling the A/E representative to call attention to items that were questionable or not in keeping with the design parameters.

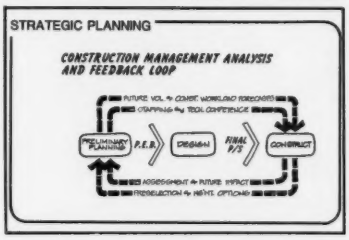
Some secondary benefits should also accrue to both the Navy and the A/E as a result of this alliance.

The effectiveness of the design can



be evaluated by the professionals who developed it as the construction proceeds, which equate to some immediate feedback on criteria and execution which should contribute to improved future design efforts. The introduction of the QAP will also force the ROICC and his staff to become familiar with the designs well in advance of advertising for bids which should result in more field input during the design stages as well as a head start on critical constructability review.

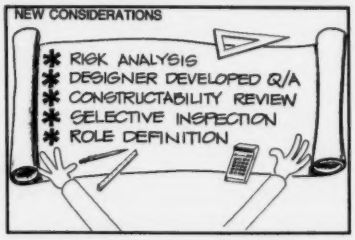
IS THIS PROGRAM FOR YOU



We see the QAP as a simple and concise document which will supplement the plans and specifications — not as a redundant publication parroting material lifted from the documents themselves! You might say that it will be a sort of "road map" that will point to danger spots along the construction route and help the ROICC and contractor avoid the many pitfalls which threaten the journey.

This would be especially true in the so-called "high tech" areas which we are now encountering, especially in electronics and communications. Since the QAP is essentially organized in a rational manner, listing key events in the sequence in which they would normally occur during construction, it will be easy for the ROICC and Construction Representatives to use.

Also included are reminders of required material submittals and shop drawings, environmental requirements, government-furnished equipment/materials, existing equipment to



be re-used, special testing procedures, and other miscellaneous contract information excerpts.

A check-off system is also included to allow field personnel to keep a running account of events as they occur as well as who witnessed the event for the Government.

Events which do not occur as scheduled are highlighted in this manner, since a gap appears on the check-off listing, and as the system will be Wang or micro-computer based, printouts of missing actions will be easy to obtain for followup. A much better and more complete contract history should result.

We have prepared QAP for two pilot, or prototype, contracts in the Atlantic area. The Western Division is also running a pilot test on two projects in California for use in comparing end results and evaluating the impact of the QAP on the final product. While not every project is significant enough to warrant a full-blown QAP we believe it will be very beneficial to the ROICC on selected projects of a more complex nature, and even though the prototypes are yet to be tested in the field, other engineering field divisions are strongly encouraged to adopt some form of this program for their own.

More specific details of the prototype plans can be provided to anyone interested in performing their own tests. We're already convinced that it is a viable, NEAT idea! □

Seabee ingenuity at work

Training aid produced from scraps

By CM2 TIMOTHY E. MERRELL, USN
Naval Construction Training Center
Gulfport, Miss.

Whoever said, "A new broom sweeps clean," had an eager listener in Construction Mechanic Chief Stephen Fell. When Chief Fell was assigned as Heavy Chassis Phase Leader at the Construction Mechanic School at the Naval Construction Training Center, Gulfport, Miss., he immediately put the broom to work.

One of his primary goals was to replace the Northwest 20 Crane Mock-up with a more up-to-date crane training aid. Initially, his proposal met with some very stiff opposition from some of the older company personnel.

Construction Mechanics and Equipment Operators alike felt that they were losing a part of their Seabee heritage. Chief Fell was able to convince them that it was indeed time for a clean sweep and soon the Northwest 20 was on its way to Defense Property Disposal Office.

By keeping a close eye on the Base Excess Property areas, Chief Fell discovered two Lorain cranes which he felt could be utilized to make one good training aid. Then came the hard part — getting the job done.

One of the first projects to be done after the two Lorain cranes were brought into the Heavy Chassis Shop in May 1984 was to cut free one drive assembly from the better of the two cranes. It was then bolted onto a new baseplate constructed by CM3 John Glass.

Under the watchful eye of Chief Fell, the job then fell in the hands of CM2 Timothy Merrell and CM2 Glenn Levak. Since both are assigned primarily as Instructors, the crane was worked on between classes and after hours when possible.

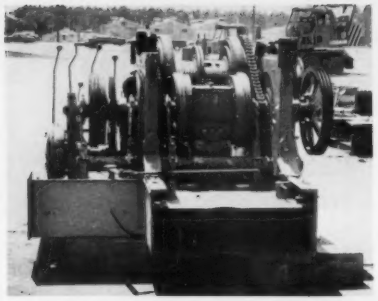
During the first week, CM2 Merrell spent much time reading manuals and asking questions of instructors at the Crane school to gather a clear picture of the operation of the crane. Next, he drew out a color-code system to be used for ease of instructing.

The following week, CM2s Merrell and Levak spent their free time in the shop tearing down the drive assembly until the frame was bare.

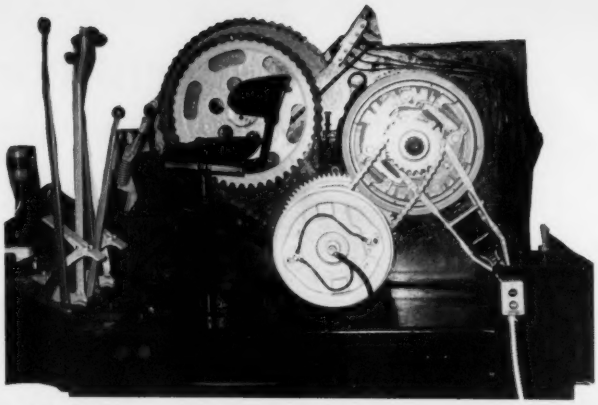
Many long hours were expended sandblasting the frame to bare metal where it was then spray-painted with three coats of primer. All other sub assemblies were then torn apart and washed in solvent until free of dirt and grease and grime.

The next three weeks were taken up

CM2 T. Merrell (from left) CM2 G. Levak and CM3 J. Glass — all Petty Officers — spent much time rebuilding a training aid from two old Lorain cranes.



Crane in the "during" stage or dismantling stage.



Crane in the "after" stage — color coded and ready for use.

with painting a color-code system on all parts.

All master cylinders were brought from Construction Equipment Department to save time. Many parts were found damaged beyond repair.

All major assemblies of the crane were reconstructed over the next month, with the help of many students awaiting instruction.

A drive system was developed to show the actual operation of the training aid. It was driven by a 15-horsepower electric motor and a two and one-half-ton truck transmission used before on the old Northwest 20 crane.

The difficult time came trying to find a drive sprocket to fit the original drive chain. While at Keesler's DPDO for the second time, two sprockets were found that could be used if welded together. They were on a sealing machine that was in an auction. A paper-work exercise had to be performed to buy the entire machine.

Armed with the required papers and toting their tools Petty Officers Levak and Merrell went back again and removed the sprockets from the newly acquired machine right in the area where it sat. They then turned the machine back in without ever moving it from the area.

The crane was then placed on I-beams and all touchups finished. The next step was to get electrical power to operate the training aid.

Satisfied that the crane was ready, Chief Fell gave his approval and the completed training aid now occupies center stage in the Construction Mechanic School's Heavy Construction Phase Shop.

The unit will familiarize "A" school students of both Construction Mechanic and Equipment Operator classes with crane maintenance and operation and afford practical "hands on" training for C1 advanced school in crane malfunctions, troubleshooting, repair, and maintenance. □

speaking from topside (continued from page 6)

In addition, our newest OICC (OICC Diego Garcia) located at Houston, Texas, manages the $430-million construction effort at Diego Garcia, British Indian Ocean Territory under a single cost-plus-award-fee contract.

PacDiv also has regional command responsibility for Public Works Centers at Pearl Harbor, Guam, Subic Bay and Yokosuka, and supports public works departments at all Navy and Marine shore bases throughout the Pacific.

Our responsibilities in public works, maintenance and operations include providing all the services and technical support needed by the fleet and its shore-based activities. This includes housing, transportation systems, utilities, public works and real estate.

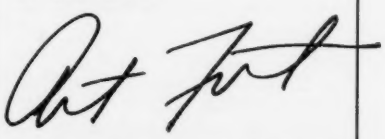
Our public works activities manage more than 7,500 units of family housing and assign and support a fleet of 14,200 vehicles which travel about 58 million miles a year. The public works activities also operate electric power, telephone, water and sewage systems.

My real estate specialists participate in the acquisition, disposal and management of Navy real property holdings in several foreign areas as well as in Hawaii and Guam. The complexities of real estate dealings in this variety of political and cultural settings is staggering and fascinating.

Our responsibilities, especially in planning, have increased in recent years to help develop CINCPACFLT's requirements for greater flexibility. Our end product is facilities contributing to a better based, better equipped Navy, and thus, in a relatively modest but still very significant way, to our country's overall posture for National defense.

I look forward to the challenges I know the future will bring, very confident in the fact that I have 12,000 highly trained professionals and specialists, both military and civilian, in the Pacific region, every day assuring that CINCPACFLT, his operating commanders and commanding officers and his shore-based commanders get the very best in support.

We also have a commitment to the U.S. taxpayers to do that job wisely, effectively and efficiently. Together, we will meet the challenges head-on by continung to develop better capabilities and looking for new and innovative ways to do our business better. Judging by the support and backing of the fine people I have working with me, I have no doubt we will succeed.



Como. Arthur W. Fort, CEC, USN
Commander, Pacific Division, NAVFAC
Commander, Naval Construction Battalions, U.S. Pacific Fleet

How to prevent corrosion underground

By FRED S. NAKAMURA
P. E., Hawaii
NAVFAC
Pearl Harbor, Hawaii

Cathodic Protection (CP) is one of the best tools for the external corrosion protection of underground metallic structures. The improper use of CP, however, can cause corrosion damage to neighboring underground metallic structures.

CP is an electrical method of preventing corrosion of underground tanks, cables, pipelines and other metallic structures. It is used extensively by naval activities and it has proven to be an effective and accepted method for preventing corrosion of underground metallic structures. Federal and state regulations now require CP for many fuel and gas pipelines.

CP systems discharge Direct Current (DC) from a power source (normally a rectifier), through an anode bed, which then flows through the soil to the metallic structure being protected.

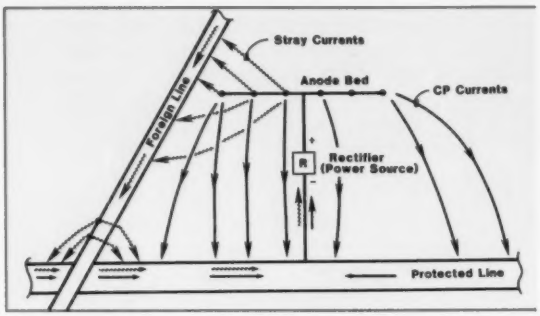
The DC current counters the corrosion current flowing out of the metallic structure with an opposing current, and in so doing stops or slows the corrosion to the structure. With the DC current flowing through the soil, however, the stage is being set for a potentially more severe problem known as interference or stray current corrosion.

Interference may be caused by stray earth currents from many other sources such as industrial equipment, electrified railways/mines, etc. We will limit the discussion, however, to interference caused by stray DC currents produced by the operation of CP systems.

Under certain conditions, the current flowing in the soil may unwittingly affect other underground metallic structures referred to as "foreign" structures, and possibly cause corrosion to the structure. Small amounts of current flowing through the soil usually have no effect on these foreign structures, however, large amounts could change the condition of the foreign structure and cause electrolytic corrosion.

Normally, stray currents flowing in the soil will be picked-up by the foreign pipeline in the area close to the CP system anode bed. This current will then flow along the pipeline to some other area where they leave the pipeline, usually at pipe crossings, to re-enter the earth to flow back to its power source.
The locations where the current is picked up by the foreign structure are receiving cathodic protection to some degree. But the locations where the current leaves the pipe to enter the soil are undergoing stray current corrosion.

Stray Current Corrosion



Failure of foreign lines can occur within a short time if corrective action on stray current corrosion is not taken. There are a number of control methods that can be taken such as installing drain cables to provide an electrical path between structures to mitigate the problem.

A qualified person familiar with these types of problems, such as the person in charge of the activity corrosion control program of the geographical engineering field division should be contacted for assistance if facilities are suspected of undergoing this type of corrosion.

If corrective measures are not taken immediately, a costly failure can be expected. It is important that CP design and maintenance personnel be fully aware of conditions which can result in such adverse effects to neighboring structures from CP installations.

It is possible to design a CP system which will protect a structure but which can also adversely corrode a neighboring underground metallic structure.

Stray current may also adversely affect the line being protected. When too much stray current is picked up by the foreign line there may be little CP current left for the pipeline for which the system was installed, and the pipeline may not be adequately protected.

In order to deal with this type of potential problem, communities have organized Corrosion Control Coordinating Committees (C4). The objectives of these C4s are to keep members informed of activity by others that may affect their underground metallic structures and to discuss and schedule ways to mitigate these adverse effects.

C4s also serve as a permanent source of information on CP installations in the community. Participation is voluntary and allows corrosion personnel to handle corrosion business on a technical level.

These committees have set up notification procedures, whereby each member is notified of all CP installations. Anyone designing and installing CP in the community is expected to notify the committee.

Almost every metropolitan area in the United States now has Corrosion Control Coordinating Committees. Activities with pipelines routed in the community should consider participating in the C4 in their area to become aware of CP installations that may affect their structures and possibly prevent these structures from becoming "victims" of stray currents.

CP installations should be properly designed, tested and closely monitored after installation to insure that the effects of stray current corrosion are minimized or eliminated. □

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- New and lasting friendships and associations with other top-notch construction professionals
- Pay and responsibility that increases as you grow and advance
- A Naval Reserve retirement package for a little something extra in your old age
- Finally, and most importantly, the pride in knowing that you are helping preserve the freedom of your country as you grow in your profession

Here's what you can do . . .

If you are a young engineer or architect, male or female, please call the Reserve Representative listed below.

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Bldg. 662, Naval Base
Philadelphia, PA 19112
Phone: (215) 897-5831/34
AV 443-5831/34

LCdr. Howard H. Huggins
Southern Region, RNCF
Naval Base
Charleston, SC 29408
Phone: (803) 743-2650/4322
AV 794-2650/4322

Lt. Robert D. McClure
Central Region, RNCF
Bldg. 1, Naval Base
Great Lakes, IL 60088
Phone: (312) 688-6955/6
AV 792-6955/6

LCdr. John A. Fessler
Western Region, RNCF
1220 Pacific Highway, Suite 203
San Diego, CA 92132
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